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THESIS

Office Layout Procedure with Special Emphasis on Standardization

by

Carl Walter Eicker
(B.S. University of Maryland 1943)

submitted in partial fulfillment of
the requirements for the degree of

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FOREWORD

Every so often some company announces its fiftieth anniversary. Oftentimes it is in the form of a booklet appropriately lettered or bordered in gold and in it there is traced, with pardonable pride, a growth from some humble beginning to a modern, flourishing, American enterprise. The original plant is pictured, usually a small one-story building, alongside of which will also be depicted the present expansive plant or plants and office buildings. Frequently there will appear in such a booklet a picture of the interior of the original office, sparsely equipped with a high bookkeeper's desk and stool to match, an iron safe, a clothes tree, and quite likely a pot-bellied stove. Such was the equipment of the average office at the turn of the century.

It is a little difficult for us of this generation to visualize a business being administered in an office so simply equipped. Unheard of, in those days, were the facilities we now take for granted. The mechanical equipment of all descriptions, indirect lighting, air conditioning and ventilating systems, and even telephones, which today are commonplace, were either unheard of or in their infancy in those relatively few years ago. Obviously, office layout in those days presented no problem.

Recognizing, however, that the innovations referred to, and others, have contributed enormously toward office efficiency, there is still much to be accomplished through the coordination of all the instruments designed and now available for the operation of a modern office. In other words, though these scientific devices have been highly perfected to perform their particular functions, by careful planning and layout they can collectively contribute even more toward smooth and efficient operations and the following is submitted with that objective in view.

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CHAPTER I

INTRODUCTION

A. Scope and Definition

1. Importance

One of the recognized requirements for effective operations in the present day office is the installation of modern working facilities. Working facilities include all of the physical aspects of the office which fall under three broad categories, i.e., layout, physiological factors, and equipment. The purpose of this thesis is to discuss layout procedure and the application of the physiological factors, with particular emphasis placed on the development of standards; while the subject of equipment will be covered only to the extent of its effect upon layout procedure and the physiological factors referred to.

The prime purpose of layout study is to determine the most economical and effective use of all available space. This is not to suggest the crowding of personnel into a minimum floor space to the detriment of employee morale and efficient operations. Rather, it proposes that office space be put to the most economical use, considering all costs and resulting benefits. Balanced against rental or building costs, and the cost of installation of special office equipment, of special layout, and general maintenance, are the net savings which may accrue through increased operating

efficiencies, plus the added comfort, health, and morale of the employees, and any favorable effect that a good layout might have on customers and the general public. This is not meant to minimize the importance of the cost of floor space, but rather it is to point out that such costs are but one factor among several to be considered in planning office layout.

While nearly all companies recognize the need for the efficient utilization of space, there is a wide variance in present day office layouts. There is still the tendency to dismiss the subject lightly and to leave the layout to the discretion of department heads, with the result that office layouts very often lack all semblance of uniformity. But more important, the placing of this responsibility on department heads, who lack knowledge of office layout, results in costly inefficiencies.

How can a company be assured that it is accomplishing the task of using its space to best advantage? The answer is in standardization. Standardization in the office is beginning to receive long overdue attention. It is a phase of office management in which the office can take a lesson from the factory. In the plant, before production is started, a careful study is made and the "best way" is determined for the entire production, including the product, materials, process, and layout of the plant. The view taken

by aggressive plant management today is well expressed in the following:

> Good plant layout, as defined at Westinghouse Electric Corporation means (a) placing the right equipment, (b) coupled with the right method, (c) in the right place, (d) to permit the processing of a product unit in the most effective manner, (e) through the shortest possible distance and (f) in the shortest possible time.[1]

Cannot this definition of layout be applied to the office with equal propriety? The office, in a sense, is a plant in that it produces the forms and records vital to the successful operation of a business. As in the plant, when a best way, be it method, process, or product, is once determined, it should be standardized. It should become the accepted way until a better one presents itself. In the case of the average office considerable thought is usually devoted to the original layout and yet through the lack of further attention, it is soon permitted to become unsuitable. A failure to take cognizance of changing conditions in work volume, procedures, and often, unfortunately, the changing whims of those in charge tend to diminish the effectiveness of the original layout.

However, there is a growing consciousness of the fact that the problem of office layout is ever present. An

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[1] J. H. Sansonetti and R. W. Mallick, "To Insure Low-Cost Production - Adopt the Best in Layout", Factory Management and Maintenance, August 1945, p. 102

indication of this trend in thinking is evidenced in the activities of the American Standards Association which is currently engaged in a study of standardization of office equipment, which is a definite step towards the development of standards for office layout.

Why has standardization lagged in the office when it has proved itself of such value in the plant? Perhaps the principal reason has been the tendency to compromise in the selection of office layout and equipment--a tendency borne of a failure to view the office as comparable to a plant or a productive unit of industry. In addition, there is the constant influence of the personal element. The desires of individuals too often receive disproportionate consideration. Personal preferences for private offices, particular makes of typewriters, special colored desks, are but a few of the many hindrances to standardization. The old story, "Our business is different" is as common in the office as it once was in the plant. Perhaps the same answer still holds, that each business is enough like the next to justify a consideration of a common set of principles of standardization. In the belief that certain standards might prove helpful as a guide in the layout out of any office, the relatively simple rules set forth in the following text are suggested.

2. Ideals

The following list of ideals will serve to indicate some of the problems and aims of the layout department:

(a) There should be a smooth flow of work through each department and the entire office. In other words, work should move a minimum distance with a minimum of backtracking.

(b) Only furniture and office machinery in active use should remain in the office proper. Obsolete or seldom used equipment takes up valuable space and should be returned to a central point for redistribution or disposal.

(c) Desks should be of a size best suited for the work at hand. Employees should be provided with chairs most conducive to comfort and efficiency.

(d) Desks should generally face in one direction, away from windows, which are a source of glare. Occasionally, it may be desirable to arrange them face-to-face where personnel must work together.

(e) Like office machines should be grouped. Noisy machines in particular should be segregated and so located as to cause the least disturbance.

(f) Persons doing work of confidential nature, for example, those handling payrolls or personnel records, should be isolated.

(g) Where personnel must receive the public, desks should be easily accessible and visitors chairs conveniently located.

(h) Heavy equipment should be placed near walls and columns where floor support is the greatest, while files, generally, should be arranged along walls or partitions.

(i) Aisles between desks should be three feet wide and corridors not less than four feet, depending on traffic and number of outlets. All departments should have direct access to the main corridors.

(j) Private offices should be held to a minimum, both in size and number. Prestige is seldom a valid reason for assignment of private offices.

(k) Illumination should be adequate according to the work performed.

(l) The office atmosphere should be conducive to maximum production. Careful consideration should be given to the matters of illumination, acoustics, heating, ventilating, air conditioning, and general appearance.

Such provisions as have been listed are not always possible, but they definitely are objectives which should be kept in mind in any attempt to create an efficient office layout.

B. Responsibility

1. Layout Department

Regardless of the size of the organization, it is imperative that the responsibility for office layout be well established if any thought of maintaining standards is to be entertained. In large organizations it will often be possible to assign this task to a special department which appropriately might well be called the Layout Department. In smaller companies, the job might be assigned to one individual, for handling along with his other duties. But, regardless of size, the job must be someone's definite responsibility, and authority necessary to carry out proper layout maintenance must be given that person or department.

2. Duties of Layout Department

(a) Objective. This department must have a clear conception of what it is expected to accomplish. It must know the limits of its responsibility and authority. It must outline the problem at hand and decide on the approach necessary to its solution following which it can then confidently proceed to effect the objective envisioned.

(b) Selection of Site and Space. Where site and space have not already been selected, it should be one of the duties of this department to assist in the selection. Time and effort so spent will be well repaid when making the layout, for a well chosen space will lend itself more readily to the incorporation of standards.

(c) Planning Standards. The size of the organization and the type of space selected will govern the extent to which standards can be profitably established. In any event, the adoption of certain standards invariably will be found advantageous.

(d) Making a Layout. The value of predetermined standards will be quickly recognized during the preparation of initial drafts of the layout.

(e) Making a Move. It is the duty of this department to supervise all moves to assure that they are made quickly, efficiently, and with a minimum of disturbance to current operations. This can be accomplished by intelligent planning.

(f) Maintenance of Records. To maintain control of office layout this department must keep certain records. A record of all changes in layout must be kept up-to-date. All plans and physical changes of the building must be recorded. In large organizations a record for space control will be necessary. This should show in concise form all available space and all space in use so that any relocations can be readily considered.

(g) Periodic Reviews. A definite system for reviewing present layouts, at regular intervals, should be inaugurated. Department heads and others frequently suggest changes in their departments. On its own initiative, however, the layout department should review periodically the present layouts to ascertain whether they are still best suited for current operations.

CHAPTER II

SELECTION OF SITE AND SPACE

A. Location Survey

1. Section of City

While the final selection of site and space may prove to be a matter of compromise, the layout department, before it embarks upon a search for available sites and spaces, should have a rather well defined conception as to what it is seeking, otherwise, a great deal of time will be lost in a haphazard approach to the problem. Consideration for some of the following factors should prove helpful in this connection. Certain sections of the city, for instance, offer definite advantages, depending on the type of business in which the company is engaged. Both the public and the employees should be considered. If contact with the public is frequent, then it is essential that the office be readily accessible. This does not necessarily apply to the whole organization. It is quite possible to locate a small segment of it, as, for example, a sales office, in the most accessible spot for the purpose of meeting the public, while the main office may be located in a less expensive or pretentious location, or in a location that more readily meets its other needs. If the public to be dealt with includes buyers and salesmen, it may be advisable to locate near offices of similar businesses.

Certain sections of some cities become known as the center for special types of businesses.

Next to consider are the employees. It is well known that companies in the so-called poorer sections of town have difficulty in securing and holding desirable employees. In other words, there is a certain prestige to be considered when selecting locations--not only insofar as the public is concerned, but also with respect to office workers. When the general section has been decided upon it should then be surveyed to determine the point within that area most desirable considering employees, the public, and other factors.

2. Nearness to Facilities

Within the section chosen it is desirable to find a site which is convenient to as many facilities as possible. First of these is the matter of transportation. Not all sites in a desirable section may be readily accessible to both employees and the public. Investigate the proximity of bus, street car, and subway lines, and of subway stops. If it is likely that the employees will drive to work, investigate the traffic problems and particularly the matter of parking.

Ascertain the company's policy with respect to eating facilities. Perhaps a company cafeteria is planned. If not, restaurants in the immediate vicinity of the tentative site should be checked for price, quality, and convenience.

Some concerns believe that good lunches are so important to the morale of their employees that they operate cafeterias at or below cost, which illustrates the importance placed on this vital factor.

Proximity to good shopping districts is of particular interest to women employees, many of whom like to do their shopping during their lunch period. If this is not possible, some are inclined to take a day off occasionally to do their shopping.

Nearness to banks and a post office is a convenience which should be considered for both the company and the employees.

While these points individually may seem small and hardly controlling when selecting a site or building, they are important in the aggregate, as they will result in better morale, lower employee turnover, lower absenteeism, and other direct economies and advantages.

B. Building Survey

1. Type of Building

Whereas the selection of the site may be made without the assistance of the layout department, it is most important that it be consulted before making the final selection of space. A wise choice will result in important savings when the actual layout is undertaken.

The primary purpose of the office building is to serve as a housing space for the office functions, and such features that best serve these functions should be looked for in selecting a building.

A secondary value of an office building is the prestige it may lend to a company. A building's advertising value can be enhanced if it is possible to name the building after the firm in question. If the concern is connected in any way with building materials, the building might incorporate these materials in its structure as a means of demonstrating their use. In most cities there are certain particularly desirable office buildings, such as the Empire State Building and the RCA Building in New York City. Many companies feel that the incorporation of the names of these buildings in their letterheads and stationery lends prestige to their business. In fact, it is not uncommon for concerns to consider the additional rent they may pay for space in a building of this character as a charge to advertising.

2. Schematic Studies

The architectural and structural features, from a functional standpoint, should be studied next. Are elevators and lobbies sufficient to meet all present and future requirements? Are there any special features that must be considered, such as fireproof vaults, exhaust flues, or floor-loading capacities?

To be assured of making a proper choice of a building space, it is necessary to attempt to visualize how the various departments for which accommodations are being sought will fit into the spaces being considered. This can be done by making some line-drawing layouts to determine where each department might be located and how the work would flow through each space parcel. Examine the size of the bays and note their adaptability to efficient layout. A most important consideration, and one often overlooked until it is too late, is the fenestration of the building; that is, the arrangement and proportioning of windows. If this is not considered, it may be found later, when private offices are being laid out, that efficiency will be greatly impaired. Since the positioning of partitions is restricted to the piers between the windows, private offices of the desired width will be unobtainable along some windows.

One method of window arrangement is known as "continuous fenestration." Exhibit I illustrates this method with modules (similar points of columns) placed four feet apart. It is seen that offices of eight, twelve, and sixteen feet widths can be laid out, but that no fractional variance is possible.

Exhibit II illustrates another method of fenestration, involving alternating windows and piers. A good example

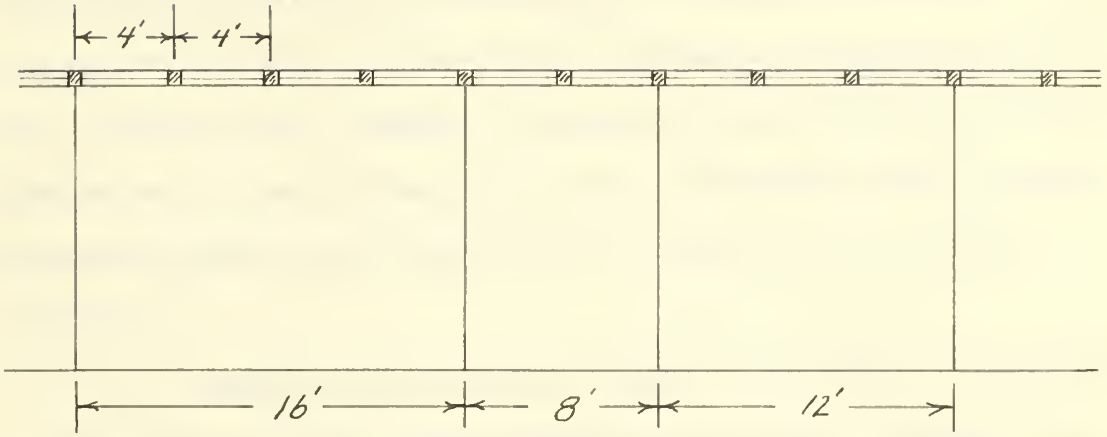

Exhibit I. Continuous Fenestration

Private offices can be constructed of eight, twelve, and sixteen foot widths, but of no fractional variants.

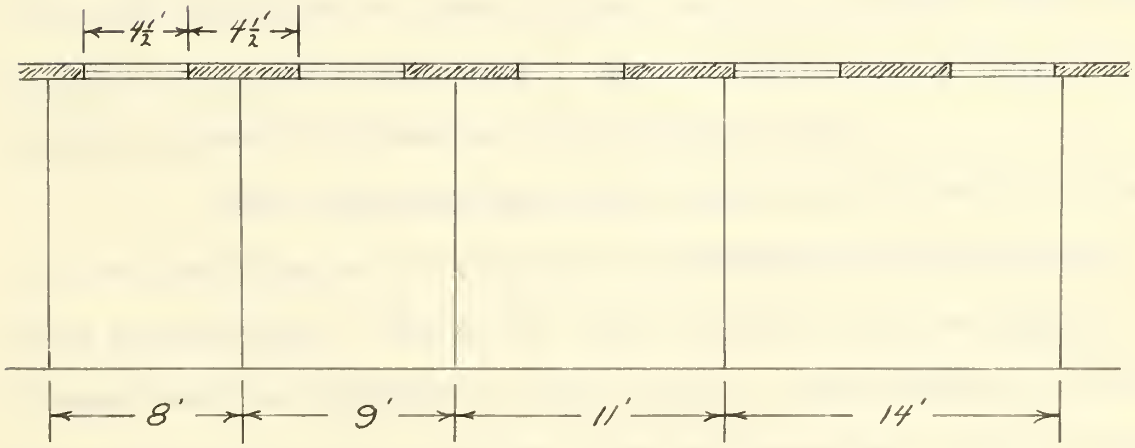

Exhibit II. Alternating Fenestration

Piers and windows are each four and one half feet wide. Private office widths can be as desired.

of such an arrangement may be found in the RCA Building in New York City. Here, windows and piers are each four and one half feet wide which permits the arrangement along the windows of offices in practically any desired widths. The advantage of this system over continuous fenestration is in its flexibility. However, it has the disadvantage of being conducive to many irregular sizes of offices which hampers standardization and results in a diminution of natural lighting.

Despite the advances made in artificial lighting, most concerns still rely heavily on natural lighting for illumination. Therefore, it is important, when choosing a space, to consider the direction in which the windows face. The higher floors of a building, those extending above adjacent buildings, admit more natural light. (Incidentally, the air admitted at these higher levels is cleaner and street noises are less disturbing.) Such conditions as these may make a sizable difference in lighting costs.

The foregoing are only some of the physical aspects of the building which should be considered in determining its suitability. There are other factors for the layout department to consider at this point. For instance, if any changes must be made in the physical structure, such as the erection or relocation of partitions, who is to bear the costs--the tenant or the landlord? Upon whom does the

responsibility rest with respect to the operation of the elevators? What services does the landlord propose to render? The answers to all these questions must be determined.

Once a lease has been signed, the layout department should be furnished a copy for reference purposes. Thus informed, it becomes the layout department's responsibility to see that no terms of the lease insofar as layout work is concerned, are violated. This is important, for the failure to observe the terms of a lease can prove costly.

3. Building Codes and Restrictions

Presumably, building codes of the city have been adhered to in the construction of the building under consideration. If, however, a company is proposing to construct its own building, there then falls upon the layout department the very serious responsibility of not only acquiring a full knowledge of all applicable codes but, also, of seeing to it that they are adhered to in the strictest fashion. Failure to do this can cause untold trouble and expense.

In any event, whether building or renting there are other restrictions to be considered. Fire codes should be studied, particularly for occupancy allowances. While the present building may meet building requirements, its occupancy may be limited by the nature of the area, the lack

of sufficient exits, or fire escapes. Table I lists some of the codes of the National Fire Protection Association. While these codes are not necessarily the law in any particular area, they are often used as a basis for local laws. Again, it should be the responsibility of the layout department to obtain copies of the local codes and fully acquaint itself with all the restrictions and requirements.

TABLE I

SAMPLE BUILDING CODES TAKEN FROM THE NATIONAL FIRE CODES FOR BUILDING CONSTRUCTION AND EQUIPMENT[1]

Lighting and Signs

2724. All public spaces, hallways, stairways and other exits shall have signs and illumination in accordance with Section 12. Exitways shall be continuously illuminated at all times when the building is occupied.

Required Exits

2730. Exits in accordance with 2713-2721 arranged in accordance with 2710 and 2711, shall be provided in sufficient number and width to comply with the following:

For buildings where the maximum occupancy is not over 1 person per 100 sq. ft. gross floor area:

$$\underset{\text{(one unit = 22 in.)}}{\text{Number Units Exit Width}} = \frac{\text{Gross Area per floor (sq. ft.)}}{100 \times 60}$$

(100 sq. ft. per person, divided by factor 60 as per 2013)

For buildings where the maximum occupancy is over 1 person per 100 sq. ft. gross floor area:

$$\text{Number Units Exit Width} = \frac{\text{Maximum Number Persons per Floor}}{60}$$

Air Conditioning

2744. All air conditioning installations shall comply with the N.F.P.A. standards on this subject. (See 14)

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[1] *The National Fire Codes for Building Construction and Equipment*. National Fire Protection Association, Boston, 1944. pp. 107-8

CHAPTER III

PLANNING STANDARDS (LAYOUT)

A. Basic Plan

1. General

The first consideration in planning layout standards is the basic circulation plan. Normally, this is supplied by the landlord; however, if it is not, the layout department should prepare one. A basic circulation plan is a skeleton drawing which locates, not only the office space, but the utility areas in which the various building services are housed, plus entrances, elevators, stairways, and main corridors. It is the responsibility of the layout department to determine whether or not the physical features mentioned will lend themselves to an efficient arrangement of the office organizational elements which must be provided for.

2. Main Corridor

All basic plans should be built around the main corridor(s) which, in effect, is the main artery running through the organizational body. It is the connection between the building entrance, reception room, elevators, or stairs, and the various working spaces. The corridor provides an easy access to any department without the necessity of having to pass through another. All building and office service facilities should tie into the main corridor. Exhibit III shows a typical basic plan in which all areas

have direct access to the main corridor, which in turn, provides a direct approach to the elevator lobby and other exits.

3. Building Services

Since locations adjacent to windows are the most desirable for actual working spaces, inside space should generally be assigned for such services as air conditioning rooms, telephone service closets, electric closets, storage space, dead record rooms, and similar facilities. Note, in Exhibit III, the location of the utility area in which the foregoing facilities are grouped.

4. Washrooms

Washrooms represent a basic facility requiring special consideration. As a general rule, the minimum requirements specified by law will be below the desired standards for washroom capacity. A flexible margin should be allowed for the changing of ratios as between male and female workers and for the expansion of either or both groups. When washrooms are adjacent to one another, the providing for a change in ratio is reduced to the simple task of relocating the partition which separates the two.

5. Reception Room

The reception room should be located near the main entrance, or it may be desirable to have a reception room in the elevator lobby of each floor, if more than one floor is involved in the layout. If frequent visitors are expected,

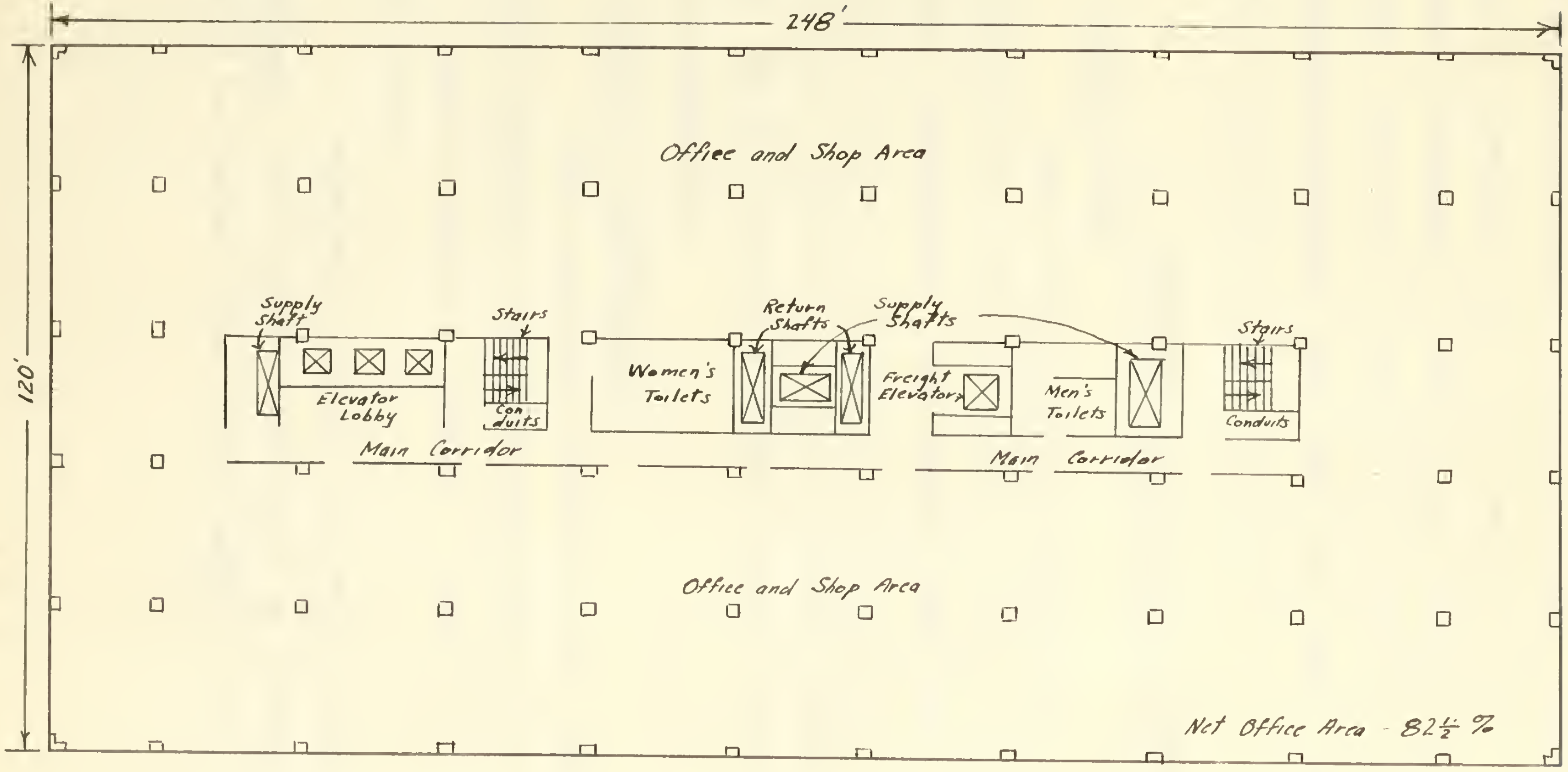

Exhibit III. A Typical Floor in the New Service Building of the Detroit Edison Company

The enclosure of all utilities in a central area permits unlimited flexibility of partition layout in open area.

it will be well not to economize unduly on space in layout out the reception room. As a matter of fact, if the visitors include customers or others whose favorable impressions are sought, the cost of providing an attractive waiting room, adequately equipped with comfortable furniture and lighting, may be considered entirely justified.

B. Grouping Organizational Elements

1. Flow of Work

Once the basic plan is established, the various organizational elements should be laid out in the most logical arrangement. The primary consideration in determining the relative position of the departments is the flow of work. All office work, within or between departments, should move smoothly through a minimum distance and with a minimum of backtracking.

2. Special Considerations

Major departments should be well separated. Subsequent expansion of a major department will be facilitated if a smaller one can be moved to accommodate the growth of the former.

Departments using considerable office machinery or equipment, which might be difficult or expensive to move, should be located where the necessity of moving is unlikely.

This means away from large departments that might be subject to expansion.

Departments should be arranged so that employees engaged in work of a confidential nature are isolated from the general office. Into this category will fall, for instance, the payroll departments whose records are subject to the natural curiosity of the general office force.

Departments whose functions necessitate frequent contact with the public should be located conveniently near the entrance. Every effort should be made to avoid the necessity of having outsiders pass through other departments in order to reach their destination.

Noisy departments or sections should be isolated from the general office and special consideration given to the possibility of acoustic control for those which are particularly noisy. The subject of acoustics will be discussed in a later chapter.

3. Centralized Services

If centralized services, such as stenographic, messenger, or filing sections, are to be used, they should be conveniently located to as many other departments as possible and particularly to the departments which might be expected to draw most heavily upon such services.

C. Unit Planning

1. Value of Unit Planning

Once having located the departments within a building, there follows the task of locating the furniture and equipment within each department. It is at this stage of the layout that the application of well-developed standards offer the greatest benefit to the layout department, for once a pattern for an office layout has been established, the task of layout out the individual office components becomes relatively simple. With units already planned, it is necessary then only to fit the unit arrangement to the tasks and space at hand. Usually the floors in a large building are similar--a condition which lends itself to unit planning. An arrangement, once considered to be satisfactory in one space, normally can be used advantageously in the similar spaces on other floors. While it might be argued that each department will have its own special work and therefore might be expected to have a special layout peculiar to its own needs, the fact remains that the major space of any office department is usually consumed by desks of a common size, and that the majority of the work passes from desk to desk. Thus, the most convenient and efficient arrangement in one department is likely to serve equally well in another.

In the first chapter, certain layout ideals were suggested, most of which should prove useful to any company. Each company, however, should decide what its own standards

are to be and then adhere to them. If it is determined that thirty-six-inch aisles are sufficient between desks, then it would be wasteful to exceed this dimension in any instance except for very special reasons. Even though there may be, for the moment, sufficient space in a given department to allow four feet for aisles, there should be no deviation from the established standards. Where extra space is available for expansion, it should be left vacant, rather than have the layout of the whole department spread out excessively. Violation of this principle will result in two serious consequences; namely, the smooth flow of work, made possible by the incorporation of well-developed standards, will be disrupted; and any expansion of the department will necessitate a complete rearrangement of the entire department.

2. Desk Arrangements

There are a number of ways in which desks may be grouped, among which are five basic arrangements suggested by Harold C. Pennick[1] and illustrated in Exhibits IV through VIII. Table II contains a summary of these five plans.

There are several factors to be considered when making a decision as to the most suitable arrangement. A proper solution is almost assured if each plan which suggests itself is appraised on its provision for:

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[1] Harold C. Pennicke, "Office Layout for Effective Operations", Office Management Series No. 110. American Management Association, 1946, pp. 34-39

TABLE II

SUMMARY OF FIVE PLANS OF DESK ARRANGEMENT[1]

PLAN	AREA COVERED (sq.ft.)	AREA PER CLERK (sq.ft.)	WORK FLOW MAJOR	INTERRUPTIONS MINOR
I	910	37.9	1	0
II	929	38.7	2	1
III	984	40.9	1	6
IV	1024	42.7	11	0
V	1120	46.6	3	0

Plan I. Desks arranged in rows of two desks placed end to end. (two rows of 12 desks each)

Plan II. Desks arranged in rows of six desks placed end to end. (four rows of 6 desks each)

Plan III. Desks arranged in rows of three desks placed end to end. (two rows of 12 desks each)

Plan IV. Single desks placed back to back arranged in rows. (two rows of 12 desks each--clerks at each pair of desks face toward each other)

Plan V. Single desks in rows. (four rows of 6 desks each--each clerk having access to an aisle on either side of her desk)

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[1] Harold C. Pennicke, "Office Layout for Effective Operations", _Office_ _Management_ _Series_ _No_. _110_, American Management Association, 1946, p. 35

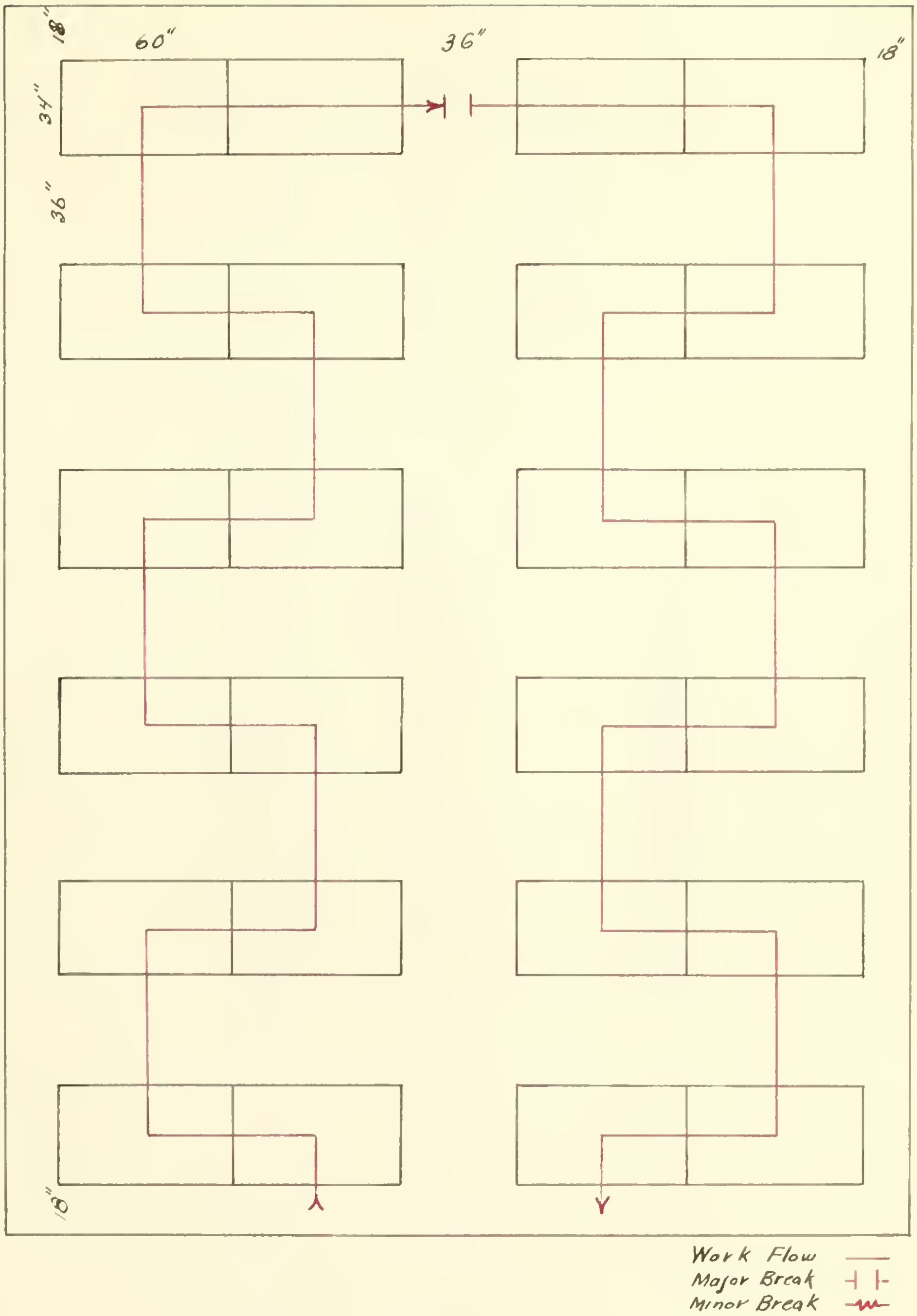

Exhibit IV. Desk Arrangement Plan 1

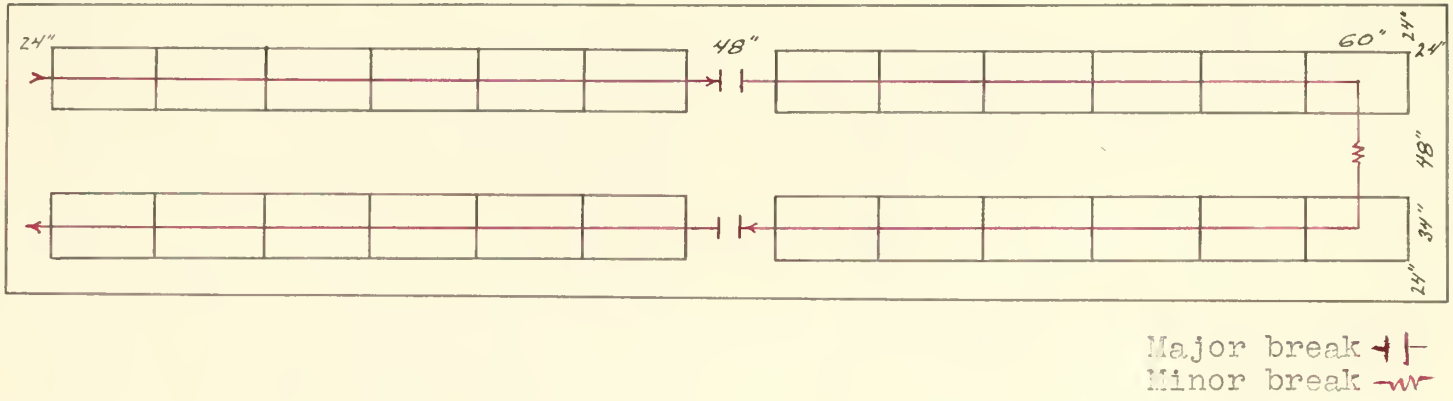

Exhibit V. Desk Arrangement Plan 2

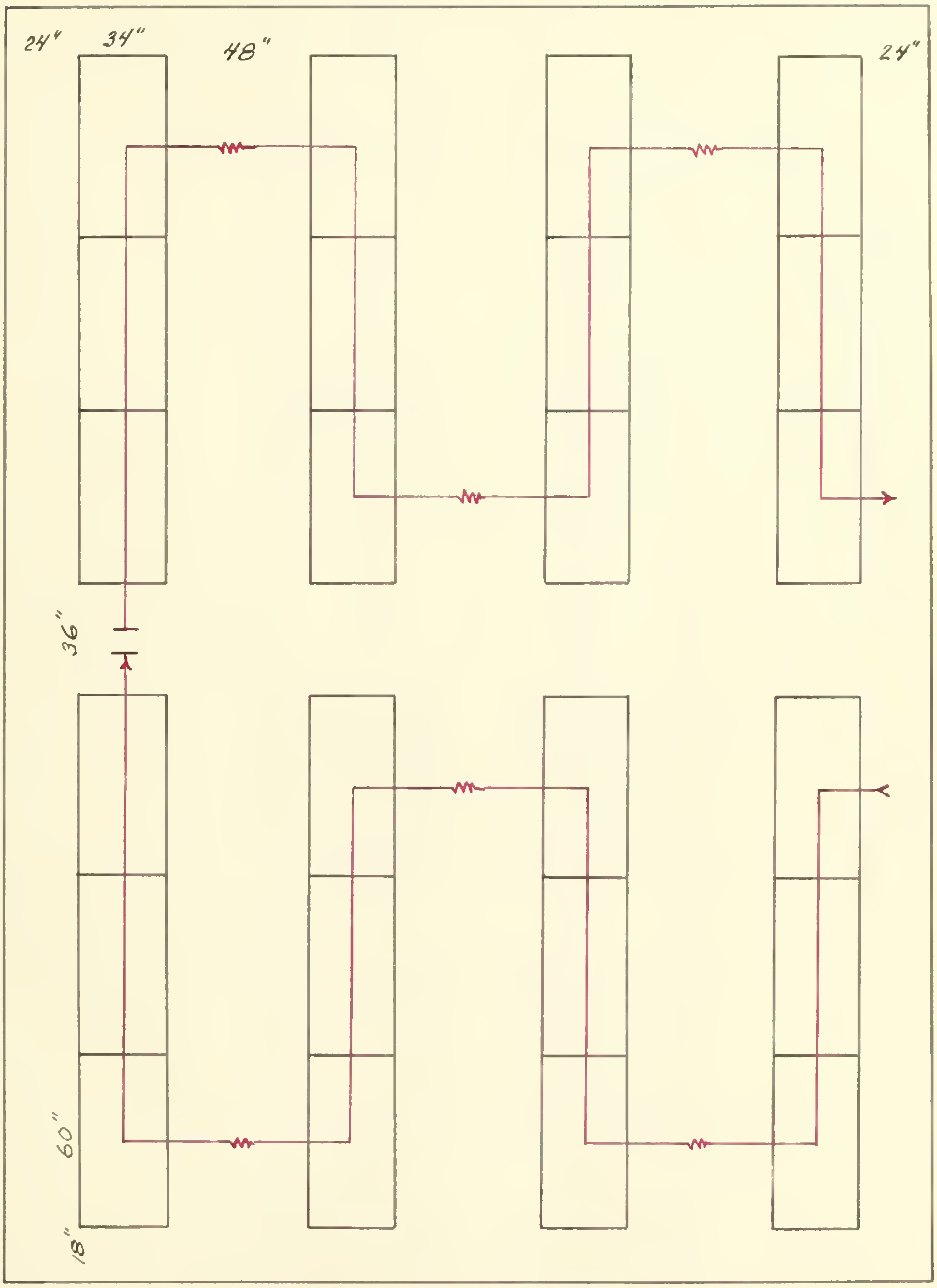

Exhibit VI. Desk Arrangement Plan 3

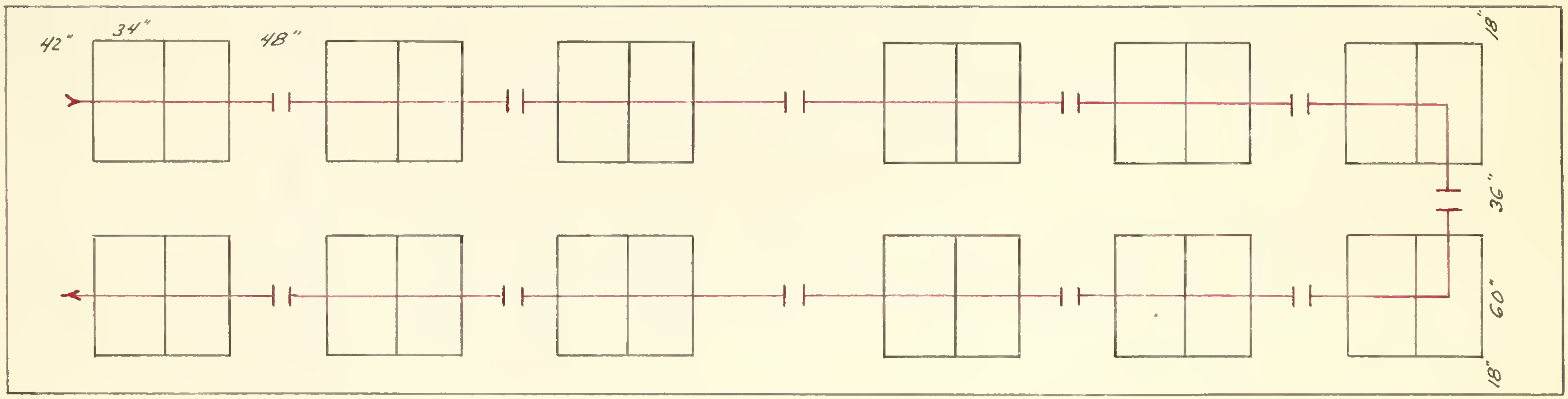

Exhibit VII. Desk Arrangement Plan 4

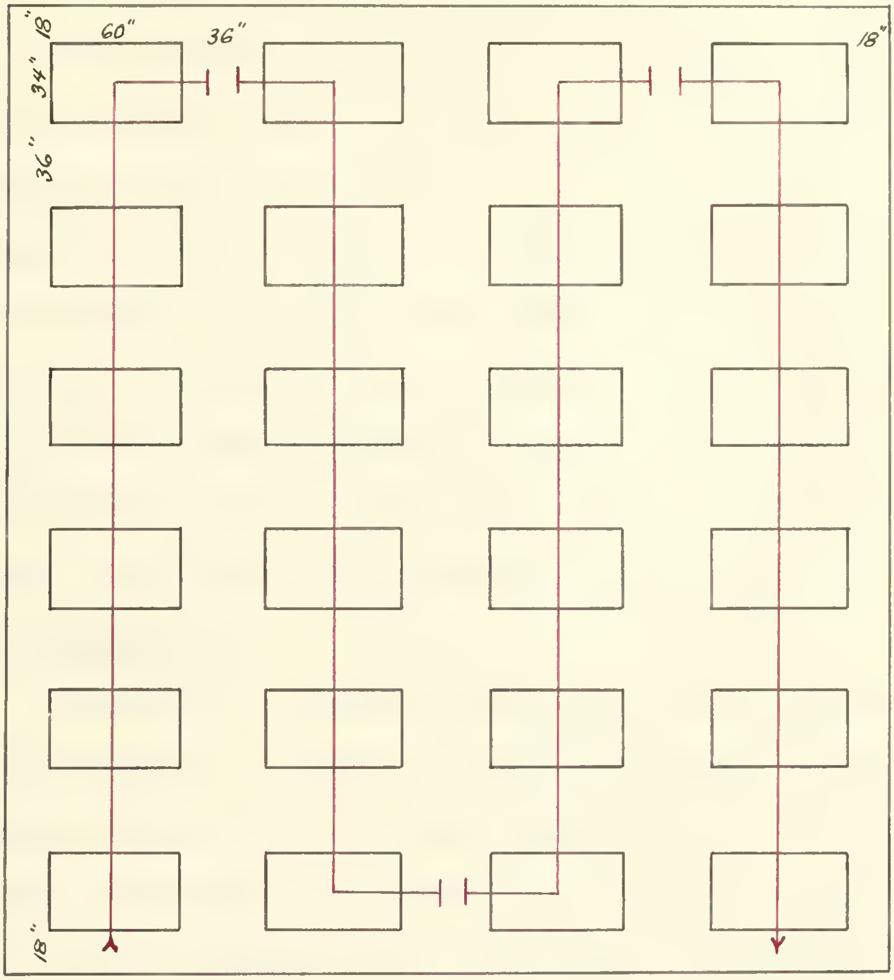

Exhibit VIII. Desk Arrangement Plan 5

(a) The lowest efficient area required by each clerk,

(b) The least interruption of work flow, and

(c) The best relative appearance.

Of the five plans referred to, desks arranged in rows of two, placed end to end (see Exhibit IV), generally is accepted as the best arrangement. There are two situations, however, where one of the other plans might prove to be more suitable. One, the particular shape and size of the space at hand may suggest the adoption of one of the alternate plans; and two, desks arranged in rows of five or six, such as illustrated in Exhibit VII, might prove advantageous where high-speed, continuous-flow operations are required.

3. Unit Arrangement

Because of a large percentage of the activities is conducted on desks, in what is usually termed the main office, and because desks utilize a very substantial portion of the total space available, the question of desk arrangement commands first consideration. Once their arrangement has been decided upon, at least tentatively, there then arises the problem of unit arrangement. Most office forces are composed of individual units, often referred to as sections, bureaus, and even departments. Common examples are billing sections, ordering departments, expediting departments, traffic departments, and so forth.

These segments of the office will vary in size and are usually headed by a supervisor. Because each has its own peculiar function, and particular requirements with respect to equipment, it is desirable to segregate them as much as possible into working units, with care given not to disturb the general pattern of the office layout.

These units, bearing in mind the purpose of layout methods, should be so located in relation to one another as to permit the smoothest flow of work. Having decided upon their location, there is then to be considered the arrangement of the facilities and equipment required within the unit.

For example, if telephones are a requirement of a particular unit, they should be so arranged as to be readily accessible to all members of the unit who may have occasion to use them. The same principle applies in connection with calculating machines, files, cabinets, and any other such facility which has a common use within the unit.

In the case of larger sections, where the head, or supervisor, enjoys the privilege of a private office, his office should be so located as to permit close supervision over his unit or group.

If there are a sufficient number of comparable units to justify it, it might be well to prepare an appropriate unit arrangement for general adoption. An example of such an arrangement is illustrated in Exhibit IX.

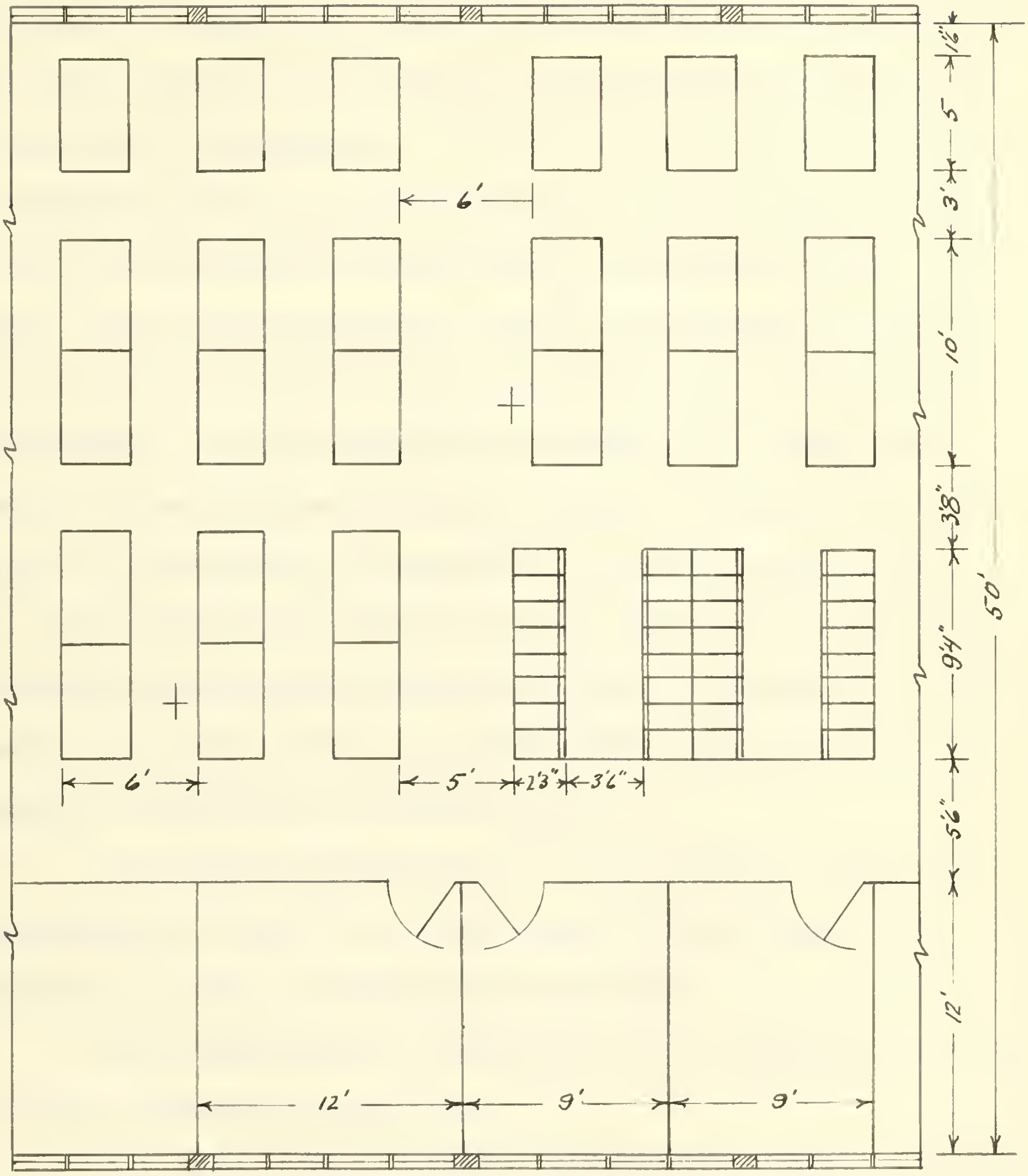

Exhibit IX. Sample Unit Arrangement

4. Integration

Although the preceding section deals primarily with the layout of individual units, reference was made briefly to their relationship to one another, which brings to the fore, the question of integration. As pointed out, it is desirable to segregate operating units engaged in different functions, but not to the extent of disturbing the general layout. For example, each unit conceivably could be separated by partitions, a practice which, though not uncommon, is decidedly impracticable. It is usually the product of a haphazard approach to the problem of office layout, wherein no thought is given to the matter of expansion. When expansion does occur, the problem is resolved by the expedient of squeezing operations and erecting another partition. Obviously, such a procedure can only lead to a hodge-podge arrangement and a consequent disruption in the work flow.

An orderly integration of the component units of a department or office in a wide open area precludes the possibility of such a situation developing.

The advantages of integration are innumerable; a few of the most important ones are:

(a) The absence of partitions constitutes a saving, not only in space, but in the initial costs of their construction.

(b) It permits an unimpeded traffic.

(c) Ventilation is immeasurably better.

(d) It permits not only the fullest use of all natural lighting, but also permits the installation of a uniform and economical lighting system.

(e) It permits a uniform spacing and alignment of electrical and telephone outlets.

(f) Changes in departments or sections can more readily be accomplished, in many instances, merely by the moving of clerks.

(g) It permits the adoption of conveyor systems for the transmission of routine work from unit to unit.

(h) It permits an economical application of acoustical treatment.

(i) It reduces considerably the task of office cleaning.

(j) An exposed area tends to discourage "soldiering" and generally lends itself to better over-all supervision.

D. Private Offices

1. Need for the Private Office

The determination as to the persons entitled to private offices usually presents a problem. However, it is a

situation which should be easily solved. Usually, the problem arises because of the personalities involved, rather than because of any physical difficulty in private-office layout.

In the past, it has often been felt that anyone in a supervisory capacity was entitled to a private office, and that the size of a private office reflected the importance of the occupant. Most progressive managements, however, are inclined today to discourage such thinking, and yet the tendency continues to exist in many offices. There still remains much difference of opinion as to who is entitled to a private office.

Although prestige is a much overstressed argument for private offices, there are instances where it is a most valid reason. Obviously, it would be inappropriate to have the President or other officials sit among the general office clerks. Perhaps a private office may be deemed necessary where an individual must meet the public, although banks have dispelled this theory to a great extent, as is evidenced by the increasing number of their vice-presidents who may be observed working in open spaces, convenient to the public.

Private offices are desirable where there exist activities of a confidential nature, or where there is a need for special concentration in connection with creative work. Granting that everyone in an office could be benefited by an atmosphere conducive to concentration, private offices present some disadvantages which tend to nullify the advantages they afford.

2. Disadvantages

One of the greatest disadvantages of the private office, and one not often recognized, is the amount of space it consumes. When there is considered the fact that most private offices consume a space equivalent to that required by three clerks, the costliness of private offices can be readily appreciated. Besides the recurring cost of the unit space, there is also the initial cost of construction to be considered.

All of the advantages of integration, enumerated in the preceding section, are diminished with the increased use of private offices. And, an additional disadvantage is a possible lowering of morale among the employees in the open area due to their being shut off from windows, while the privileged enjoy all the natural light and relaxation which a view from the windows affords.

3. Planning of Private Offices

As already indicated, the number of private offices will depend upon individuals performing duties of a confidential nature, or work requiring an unusual amount of concentration; and who, because of their positions, are entitled to this special consideration. Department heads or section heads who must frequently confer privately with individuals should very likely be assigned private offices. However, individuals who

hold only occasional conferences can often make use of conference rooms, which precludes the need for a private office.

The size of private offices depends upon the number of occupants, the type of work involved, and whether or not the office is intended for any conference work. An office intended merely to afford maximum concentration need be only of minimum dimensions.

With the improvements made in lighting, acoustical control, and air conditioning, there is no longer a wide differential in the desirability of space in the modern office. Therefore, if it is agreed that the factor of prestige is not too vital, the locating of a private office away from its time-honored position along the windows, might be quire in order. This would be particularly advisable if the fenestration of the building is such as to present special layout problems in the placing of private offices along the windows. Such an arrangement precludes the occurrence of any dissatisfaction on the part of general office employees which sometimes results when all the advantages of outside exposure are denied them because of the obstruction private offices create. In other words, "the greatest good for the greatest number" might be salutary.

4. Examples of Private Offices

With definite needs established for a number of private offices of a particular size and type, there follows

the task of designing the actual layouts most appropriate for these needs. This task will be simplified if a selection can be made from several standard layout plans which have been previously developed in accordance with good layout practice.

The advantages of this procedure are several. First, there is the assurance that the resulting layouts will always conform to good practice if care has been given the selection of the original standards. Second, there is a substantial saving of time once the standard layouts have been developed. And third, private offices of standard sizes simplify materially the job of planning unit arrangements.

Exhibit X illustrates one arrangement which might be adopted as a standard layout for a private office where concentration is the prime consideration.

E. Partitions

1. Need for Partitions

While the use of open spaces has been stressed, it is realized that certain partitions are usually necessary to the completion of the average office layout. Often a new tenant in a building will find that the only permanent partitions on typical floors are those housing the utilities and the main corridors. Therefore, it will fall to the tenant to decide what, if any, additional partitioning is required to create his desired layout. Private offices, of course, must be constructed of partitioning and where integration is not

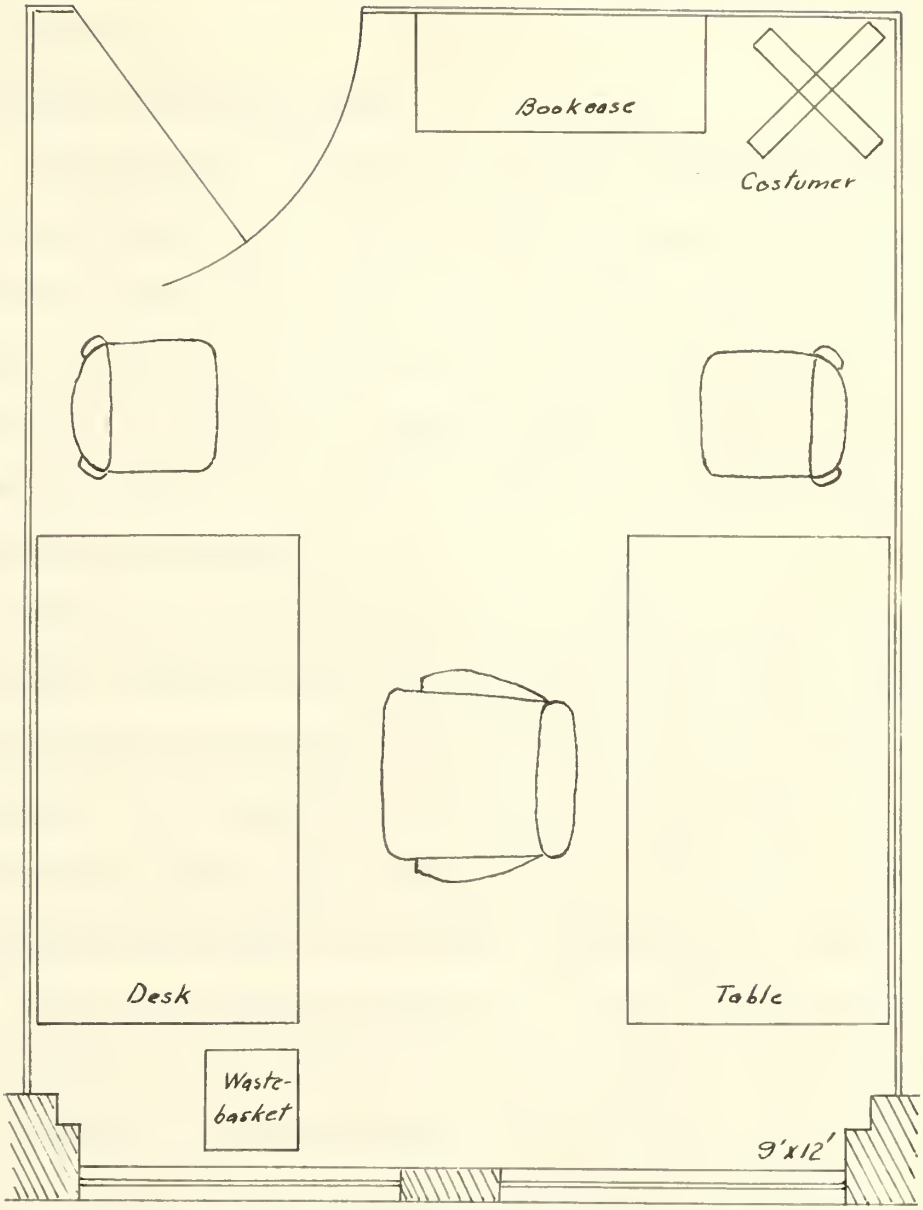

Exhibit X. Private Office Designed for Concentration

advisable, for one reason or another, partitions may be required to separate departments, and even bureaus and sections within departments.

2. Selection of Partitioning

Considerable progress has been made in the development and improvement of various types and makes of partitioning, with the result that there is available on the market today quite a selection from which to choose. They all have some features to recommend them--too many to dwell upon here; however, there are certain characteristics which merit particular consideration.

While the first costs of plaster-type partitions are generally cheaper than those of metal and glass construction, the latter are often more economical in the long run. For instance, it is important to select a type which can be easily moved and which has a high salvage value--features which recommend the metal and glass-construction types.

As to the choice between ceiling-high and part-high partitioning, the latter will decrease the problems of lighting, heating, and air conditioning, and is therefore recommended unless complete soundproofing is required. Part-high partitions are often employed to provide privacy where work of a confidential nature should be kept from prying eyes. They may also be used to cut off drafts, such as might be prevalent around a receptionist's desk in an exposed location.

Table III illustrates a comparison between ceiling-high and part-high partitions constructed of the more common materials.

TABLE III

A GUIDE FOR PARTITION SELECTION[1]

REQUIREMENTS	CEILING HIGH					PART HIGH		
	Glass	Plaster	Wood*	Metal	Composition	7'0" High	Dwarf	Railing
1. Soundproof	x	x	By adding Rock Wool					
2. Light	x	By the addition of borrowed light				x	x	x
3. Air	By the addition of transoms and grille					x	x	x
4. Electric Runways	By the addition of removable base					x	x	x
5. Movability (Salvage)			x	x	x	x	x	x
6. Decorative	x	x	x	x	x	x	x	x
7. Ease of Maintenance	x			x	x	When of metal or composition		
8. Flexibility (Doors, etc.)	x			x	x	When of metal or composition		

*Fire regulations sometimes prohibit the use of wood partitions in certain locations.

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[1] *Office Planning and Layout*, Metropolitan Life Insurance Company, Policyholder's Service Bureau, 1930, Revised 1945, p. 15

CHAPTER IV

PLANNING STANDARDS (PHYSIOLOGICAL FACTORS)

A. General Considerations

Good office layout requires more than a proper arrangement of departments, private offices, desks, and aisles. Important as these factors are, there are others which deserve the utmost consideration. Reference is made to the physiological factors which influence the employees' morale and efficiency to a degree beyond what is usually appreciated. These factors, including illumination, acoustic control, air conditioning, type of furnishings, and general appearance, are matters, the responsibility for which, falls directly within the prerogatives of the layout department. Proper attention to these important elements will contribute immeasurably towards the maintenance of clean, safe, healthy, and pleasant working conditions, all of which enhance efficiency.

It is becoming common practice to consider these factors in combination with one another; however, for purposes of this discussion, each will be covered separately.

B. Illumination

1. Purpose

"The purpose of lighting (illumination) is to provide efficient and comfortable seeing as an aid to office

operation and the conservation of vision."[1] The purpose of lighting is thus defined by the Office Lighting Committee of the Illuminating Engineering Society.

The three main controllable factors contributing to proper seeing will be discussed with special emphasis on those phases which should be of particular interest to the layout department. These factors are as follows:

2. The Task for Which Illumination is Required

The effort and the time required to visualize a task properly is determined by the size of the object, its contrast with background, and its brightness. The first two conditions mentioned are problems of the individual department heads to resolve to the best advantage. The third condition, i.e., brightness, is the particular problem of the layout department and this is where the question of lighting enters the picture.

3. Lighting

The term brightness, as used here, is the result of an amount of light cast upon a task or object. Table IV sets forth a list of recommendations with respect to the various quantities of light required for different office purposes. These values are not intended to supply the maximum lighting efficiency, for beyond a certain point an additional amount of light is not economically justifiable. In other words, there

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[1] Recommended Practice of Office Lighting, Committee on Office Lighting of the Illuminating Engineering Society. July 1945, p. 5. (This section on Illumination has been largely drawn from this booklet.)

TABLE IV

RECOMMENDED VALUES OF ILLUMINATION[1]

	Footcandles
Difficult Seeing Task Involving: (a) Discrimination of fine details such as 6-8 point type (b) Poor contrast (c) Long periods of time Such as: Auditing and Accounting Business Machine Operation Transcribing and Tabulation Bookkeeping Drafting Designing	50
Ordinary Seeing Tasks Involving: (a) Discrimination of moderately fine detail such as 8-12 point type (b) Better than average contrast (c) Intermittent periods of time Such as: General Office Work (except for work coming under "Difficult Seeing Tasks" above) Private Office Work General Correspondence Conference Rooms Active File Rooms Mail Rooms	30
Casual Seeing Task Such as: Inactive File Rooms Reception Rooms Stairways Washrooms, and other service areas	10
Simple Seeing Tasks Such as: Hallways and Corridors Passageways	5

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[1] *Recommended Practice of Office Lighting,* Committee on Office Lighting of the Illuminating Engineering Society, July 1947, p. 8

is a point where the law of "diminishing returns" begins to apply. However, since the efficiency of lighting equipment decreases with use and accumulation of dust, higher initial values must be provided for in order to maintain the values suggested. The layout department should prescribe a definite program for maintaining the lighting equipment in such condition as to assure at least the minimum quantity of light at all times.

Acknowledging that a certain quantity of light for a given task is imperative, the quality of light is no less important. As a matter of fact, quality, the more complex part of lighting, should be kept at the highest degree possible for, in contrast to quantity, maximum quality is always economically justifiable, and can be maintained at a relatively low cost through the application of a little forethought in the selection and location of equipment.

Quality of illumination is reduced by many factors, among which are glare, large-brightness ratios, poor distribution, low diffusion, and improperly colored surroundings. Usually, however, only the more serious deficiencies, such as excessive glare, are readily recognized, although all affect seeing efficiency and comfort.

4. Direct Glare

Glare (either direct or indirect), which reduces visibility and produces visual discomfort, is caused by high brightness or extreme differences in brightness in the visual field.

Direct glare is caused by a direct view of the source of either natural or artificial lighting. An unshaded window is a common natural source. Such windows should be covered by some type of shade, blind, louver, or baffle system to prevent a direct view of the sun or bright portions of the sky. In layout work, particularly, where natural light represents a large portion of the office illumination, desks should be arranged so as to permit the light to fall over the workers' left shoulder wherever possible, and in no case should any worker be compelled to face a window where glare exists.

The artificial source of glare is lighting equipment of excessive brightness. If the current lighting equipment produces such an effect, and cannot be shielded without destroying its effectiveness, then it should be replaced with equipment of a lower brightness. Exhibit XI illustrates the manner in which bright equipment should be shielded to prevent direct glare from occurring within the area of normal sight.

Glare can be reduced and seeing improved by:

(a) Decreasing the brightness of light sources and lighting equipment.

(b) Diminishing the area of high brightness causing the glare condition.

(c) Increasing the angle between the glare source and normal line of sight.

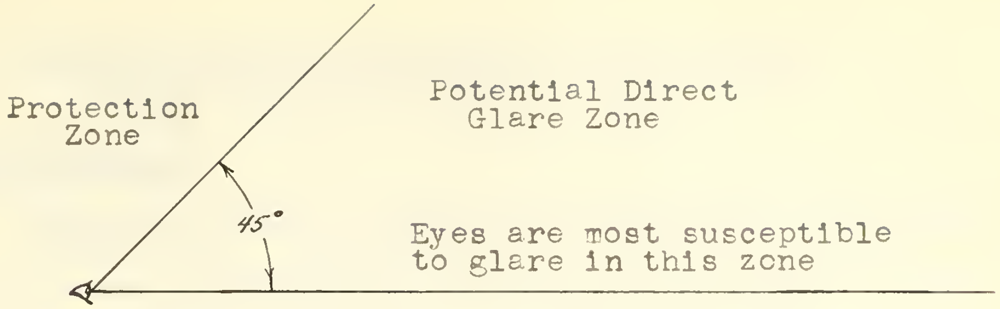
Protection Zone
Potential Direct Glare Zone
45°
Eyes are most susceptible to glare in this zone

Fig. 1

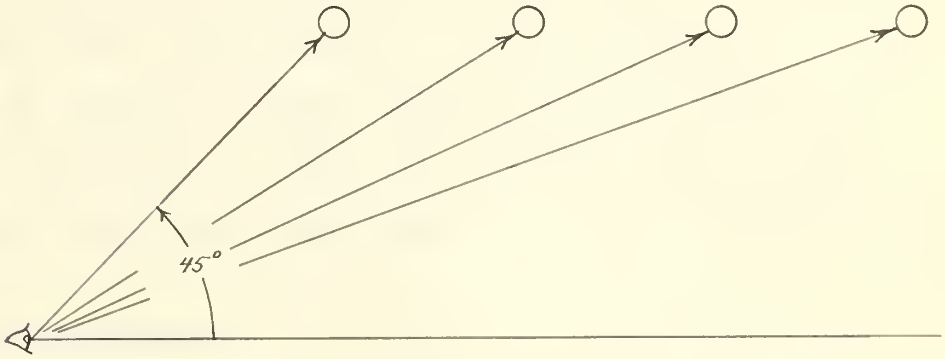

Fig. 2

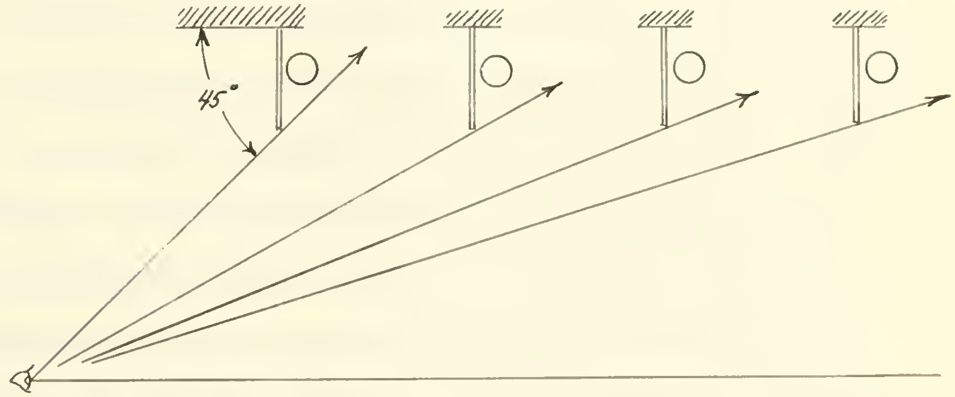

Fig. 3

Exhibit XI. Method of Shielding Bright Luminaires

(d) Brightening surrounding areas against which the glare source is seen.[1]

5. Indirect Glare

Indirect glare is caused by reflections from shiny surfaces. Where the brightness of the source cannot be reduced to prevent shiny reflections, either the light source or the task should be so placed that the image is directed away from the eye of the observer. Reflected glare can also be reduced by the use of light matte coverings applied to dark, glossy desk tops. Glass tops, while popular, often produce shiny reflections and their use should be discouraged.

6. Light Distribution

Light distribution should be kept as uniform as possible. This can be accomplished by spacing the lighting equipment in keeping with its light distribution characteristics and the physical characteristics of the room. Well-diffused, evenly distributed light will not only help to eliminate annoying shadows, but will create a flexibility in the arrangement of office operations and equipment which would not otherwise be possible. A very practical means of diffusing light is in the use of high reflectance matte finishes on room surfaces. This treatment creates a secondary lighting source which not only produces the uniformity desired, but utilizes light which would otherwise be absorbed and lost.

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[1] Recommended Practice of Office Lighting, Committee on Office Lighting of the Illuminating Engineering Society, July 1947, p. 14

7. Environment

The importance of environment with respect to seeing is more readily understood when it is realized that the eyes function most comfortably and efficiently when brightness within the entire field visioned is uniform. The attainment of complete uniformity is virtually impossible, and even if it could be accomplished, the cost would be all out of proportion to the advantages produced. However, it is desirable to reduce brightness difference (brightness ratios) to low values, such as those suggested in Table V.

To control brightness ratios, it is necessary to give particular attention to the reflectance values of room and furniture finishes since the wise selection of such finishes generally will guarantee the desired reflectance values which in turn will produce the low brightness ratios sought. Reflectance value is the ratio of the light reflected to the total light that strikes the reflecting surface. Table VI suggests the reflectance values that will aid in maintaining the proper brightness ratios, while Table VII indicates the colors which produce various reflectance values.

As the desk top occupies most of the visual field of the occupant, the nature of its finish is of prime importance. A matte surface of high reflectance value will produce the low desired brightness ratio and will, at the

TABLE V

RECOMMENDED BRIGHTNESS RATIOS[1]

Brightness ratios of areas of appreciable size from normal viewpoints should not exceed:

3 to 1	Between tasks and adjacent surroundings,
10 to 1	Between tasks and more remote surfaces,
20 to 1	Between luminaires (or windows) and surfaces adjacent to them,
40 to 1	Anywhere within the normal field of view.

These ratios are recommended as maximums; reductions are generally beneficial.

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[1] *Recommended Practice of Office Lighting*, Committee on Office Lighting of the Illuminating Engineering Society, July 1947, p. 14

TABLE VI

RECOMMENDED REFLECTANCE VALUES[1]

	Per cent
Ceilings	85
Walls	60
Desk Tops	35
Furniture	35
Floors	30

TABLE VII

REFLECTANCE VALUES OF COMMON COLORS[2]

	Per cent
White-new	82-89
White-old	75-85
Cream	62-80
Buff	49-66
Ivory	73-78
Gray	17-63*
Light Green	48-75
Dark Green	11-25
Light Blue	34-61
Pink	36-61
Dark Red	13-30
Yellow	61-75
Dark Tan	30-46
Natural Wood Brown Stain	17-29
Light Wood Tarnish	43-49

*Grays vary remarkably depending on the way they are prepared.

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[1] Recommended Practice of Office Lighting, op. cit., p. 15

[2] "Effect of Color of Walls and Ceilings on Resultant Illumination", Lighting Data, Lamp Works of General Electric Company, May 1922

same time, keep reflected glare down to a practical minimum.

Ceilings and the upper parts of walls should be finished in white or a light color to give the high reflectance values desired. If the ceilings and walls are to be finished with acoustical material, the layout department should make certain, before contracting for such material, that it has a high reflectance value.

8. Selection of Lighting System

Lighting systems are classified according to their patterns of light distribution. A system in which over ninety per cent of the light produced is distributed upward is known as indirect lighting, while a system in which over ninety per cent is directed downward is known as directing lighting. Systems producing effects within this range are classified as semi-indirect, general diffusing, and semi-direct. A knowledge of the general advantages and disadvantages of each classification will be helpful in deciding upon the one best suited for the purpose intended.

Indirect lighting provides excellent quality but with only moderate-to-low utilization. In other words, while light thus furnished produces comfortable and efficient seeing, there is involved a certain waste due to a portion of it being absorbed by the surface from which it is reflected. Conversely, direct lighting is characterized by good utilization,

but the quality of illumination, normally required for office tasks, is obtained only if precautions are taken to use close spacing or large-area, low-brightness equipment. The intermediate systems combine, to different degrees, the characteristics of both the direct and indirect systems. In considering lighting equipment and determining which is the best suited for the purpose in mind, the following questions should be posed:

(a) Will it produce the required quantity of light?
(b) Is it neat in appearance and in keeping with surrounding architecture and decorations?
(c) Does it produce maximum efficiency for the required purpose?
(d) Can it be properly shielded?
(e) Will its visible brightness be comfortable in the intended surroundings?
(f) Is it well constructed electrically and mechanically to serve the intended purpose?
(g) Is it constructed of permanent and durable materials?
(h) Can it be easily relamped and cleaned?
(i) Is its cost commensurate with the results and effects to be obtained?[1]

If all of these questions can be answered in the affirmative, the equipment considered will undoubtedly prove to be satisfactory.

C. Acoustic Control

1. Purpose

Because noise is such an abstract matter and because

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[1] Coleman L. Maze, (ed.), Office Management, A Handbook, New York, The Ronald Press Company, 1947, pp. 368-9

of the difficulty of measuring its harmful effects, or of weighing the benefits which result from its elimination, advancement in the field of acoustic control has, until very recently, been relatively slow. While there has long been a consciousness that noise seriously affected efficiency, that it is a fact has now been proved. As a result of this awareness, considerable progress has been and is being made in noise control.

2. Method

There are two major methods by which noise can be reduced. First, is the control of noise at its source which can be accomplished in a number of ways. For example,

(a) The use of equipment which has been constructed to be as noiseless as possible. (e.g., the noiseless typewriter)

(b) The use of felt under noisy machinery.

(c) The treatment of furniture through the proper oiling of moving parts, as in the case of swivel chairs, and through the use of rubber or non-metallic casters.

(d) The use of muted phone bells.

(e) The installation of automatic door closers.

(f) The installation of an air conditioning system. (Will eliminate the necessity of opening windows through which outside noises would normally enter)

(g) The adoption of an efficient layout plan and work routines which will keep walking down to a minimum.

The second method of noise control is in the treatment of surroundings to absorb noise. There are available on the market today various types of acoustic control material composed of a substance, and so formed, as to effectively reduce common office noises. There are too many types of such material designed to deaden noise to describe here, but in making a selection, the following points should be considered:

(a) It must have a high absorption efficiency. (absorption efficiency being the ratio of the noise absorbed to the total noise that strikes the acoustic material)

(b) It must be fireproof.

(c) It must have a high light-reflection efficiency.

(d) It must be attractice in appearance.

(e) It must be economical from several viewpoints:

  1. The original cost should be in line with that of similar products available in the market.
  2. It should be economical to maintain.
  3. It should have a high salvage value and should be in such form, and so

constructed, as to permit alteration or relocation at a minimum expense.

4. It should be durable and of long life.

Generally, treatment of the ceilings is sufficient and is nearly always economically justified, regardless of the office activities. However, in cases of unusual noise, the treatment of walls is also recommended.

In private offices, board rooms, and the like, rugs and drapes serve not only a decorative purpose but supplement regular acoustic material in the deadening of noises.

D. Air Conditioning

1. General

Although still a relatively young industry, air conditioning is a subject about which volumes have been written. However, for the purpose of this thesis, it will be covered only to the extent that it affects the plans of a layout department. Because it is really a science in itself, the layman (and that includes the average layout man) can hardly be expected to be acquainted with more than its purpose and basic principles. Nevertheless, the question of air conditioning presents a real problem with respect to office layout, and places upon the layout department a considerable responsibility.

Because it requires a certain amount of space and a proper location of equipment to operate at maximum efficiency, the installation of air conditioning equipment is one of the

first factors to consider in the layout of an office. Recognizing that the matter of air conditioning requires a special knowledge, the safest approach to the problem is to seek expert advice. Thus it would be well for the layout department to call in qualified air conditioning experts for assistance. However, in order to obtain the best advice, the layout department should first determine, as fully as possible, the exact conditions which seem to recommend the installation of an air conditioning system. The layout department will then be in a position to explain quite fully to the air conditioning people the requirements to be met. The first question is, of course, whether or not air conditioning equipment is necessary. This can best be determined through an understanding of the purpose of such equipment and deciding whether it will contribute enough to the objective to justify its purchase price and cost of maintenance.

2. Purpose

The purpose of air conditioning equipment is to provide an atmosphere conducive to human comfort through the control of temperature, humidity, air motion and air purification. Until very recently its advantages have been recognized principally by concerns and industries whose operations require an appeal to the general public. For instance, theaters, department stores, and restaurants have seen in air conditioning a means of attracting the public to their establishments.

Businesses whose operations involve no direct contact with the public have been slow to recognize the merit of air conditioning as it might apply to them.

Recently though, aggressive and modern concerns which realize that employees constitute a group quite as important as customers, have come to see in air conditioning not only a means of contributing to the general contentment of their working organizations, but, from a very practical standpoint, have come to view it as an instrument which can do much in the way of increasing productivity and efficiency in general office work. Of particular interest to the layout department, an air conditioning system, in accomplishing its purpose, contributes much in the way of creating new layout possibilities by making all office space of relatively equal desirability.

3. Requirements

Air conditioning systems are designed to meet certain occupancy conditions, and will do an excellent job as long as no material change in the requirements occurs. In other words, a system can be designed to meet the requirements of almost any given area, occupied by any given number of employees, and with sufficient flexibility to meet the needs of any increase of personnel up to twenty per cent. In addition to the size of the area and the number of occupants, there are still other factors to consider.

The amount and kind of lighting, for instance, is

an important consideration. The quantity of heat that lighting equipment generates is surprisingly large, and if the work to be performed, in part or all of the area, is of such a nature as to require abnormal artificial lighting facilities, that fact would be of particular moment.

If it is anticipated that any unusual amount of mechanical equipment will be used in the area under consideration, that fact too, should be given special attention for equipment of this nature produces more heat than is generally suspected. Furthermore, mechanically operated machines are frequently the source of objectionable fumes which should be dissipated, a function which air conditioning equipment will perform.

Finally, the physical features of the area itself must be carefully considered. The number of private offices, partitions, and their locations will have a decided influence on the size and type of air conditioning equipment required. Partitions of the low type cause no particular problem in this connection; however, those constructed ceiling-high and private offices completely walled require special treatment in the arrangement of air ducts.

If none of the foregoing conditions constitute problems in the immediate layout plans, inquiries should be made as to the possibilities of their arising in connection with any contemplated change or expansion of operations planned for the future.

E. Furnishings

1. General

If the making of a layout, either in the case of a new office or the rearrangement of an existing one, involves the securing of new furnishings and equipment, the responsibility for the selection of such items might well be left to the discretion of the layout department. In any event, the layout department should be consulted and given the opportunity to offer any suggestions it may have in connection with its effort toward standardization of office layout.

The subject of furnishings is too large to cover in any great detail here; in fact, it could well be the subject of an entire thesis. However, without attempting to go into the merits, advantages, and disadvantages of all the styles and types available on the market today, this section will present certain basic principles which should be considered in the equipping or refurnishing of an office.

2. Desks

As implied earlier, the desk is one of the most important pieces of equipment in the average office. Because of the space desks consume and as they usually represent the bulk of the furnishings in an office, they deserve the special consideration of the layout department.

Their purpose is twofold, in that they not only furnish the place upon which most of the functions are performed, but they also provide convenient spaces in which to store office supplies and records.

In the selection of desks, there are four factors which should be borne in mind:

(a) Their individual utility value,
(b) Their adaptability to good layout,
(c) Their aesthetic features, and
(d) Their cost.

From a utility standpoint, desks should have flat, smooth tops, with a special resistance to wear. They should be of a proper height and of a size adequate to accommodate the work to be performed upon them. They should be well constructed and sufficiently open underneath to facilitate cleaning the floor under and around them. The drawers should be logically arranged to permit ready access to frequently used supplies and of a size to accommodate all standard or regularly used material. Consideration should be given to the need for special-purpose desks, as for instance, those used in connection with the operation of typewriters and calculating machines. Specially-designed desks are available for these particular functions.

From a layout standpoint, desks should be of standard sizes and as small as practicable. The adoption of

standard sizes will facilitate layout arrangements that are conducive to smooth work flow. Furthermore, through the use of standard sizes, it is frequently possible to make changes in work routines without the movement of desks, for usually such changes can be accomplished merely by transferring personnel.

From an aesthetic standpoint, the layout department should also consider the factors of design, finish, and color of the desks with the view to having them fit harmoniously with the layout plan in general. Fortunately, the factors that tend to create a good working layout are usually those which enhance the general appearance of the office.

Finally, from the standpoint of cost, desks should be relatively plain and of standard design. Desks of this character usually cost less, are relatively easy to repair, and of more importance, less difficulty is likely to be encountered when the necessity arises for the replacement or additions to the present equipment.

If all of the foregoing factors are carefully considered, there is every assurance that an intelligent selection will result.

3. Tables

Tables are the equivalent of desks and all that has been written, with the exception of the factor of storage, applies to them with equal importance. They should be of a

standard minimum size, study in construction, plain in design, and uniform in color and finish. If they are intermingled with desks, they should match the desks with respect to all the features mentioned above.

Many concerns favor the use of tables in lieu of desks in the belief that the drawers and compartments in desks serve as a means of concealing unfinished work. There is also a tendency on the part of employees who work on desks to accumulate an undue supply of stationery and other office material which frequently becomes soiled or damaged resulting in an unnecessary waste.

In offices where tables have been adopted as the standard "work bench" the occupants are required at the end of each day to deposit their unfinished work in folders with a central file section. The purpose of this arrangement is twofold: first, it permits the supervisor to review the condition of the work in his section or department at one central point, eliminating the necessity of going from desk to desk for that purpose; second, in the event of an unexpected absence of an employee, his or her unfinished work is readily available for someone else to pick up if it is something which must be kept currently up to date.

4. Chairs

Chairs have been the subject of a considerable amount of research and it has been definitely demonstrated that they

have a tremendous effect upon the efficiency of employees and consequently upon the quality of their work. The subject is considered so important that there is hardly a manufacturer of office furniture who doesn't have a line or two of specially designed chairs which incorporate features intended to furnish maximum comfort consistent with the purpose to which they will be put. As a matter of fact, even in the case of ordinary chairs, manufacturers are giving more and more attention to the elements of comfort and efficiency.

As indicated, there are a great many styles and types of chairs on the market, nearly all of which have some features to recommend them, which facts makes selection a little difficult. However, the problem is simplified if each style or make under consideration is appraised on the basis of a set of fundamental principles to consider. In this connection no better list of recommended features could be used as a guide in equipping an office with chairs, than that proposed by William Henry Leffingwell. His list is so comprehensive that it seems appropriate to quote it here in full and to attach hereto as Exhibit XII a reproduction of his drawing of the chair he describes.

> Leffingwell correct posture chair. Ten features: 1. Curved-top back rail--to fit the natural curves of the shoulders and to give them correct support in the correct posture; rounded corners and smoothly finished. 2. Adjustable back rest--gives firm support at the lumbar regions. The back rest

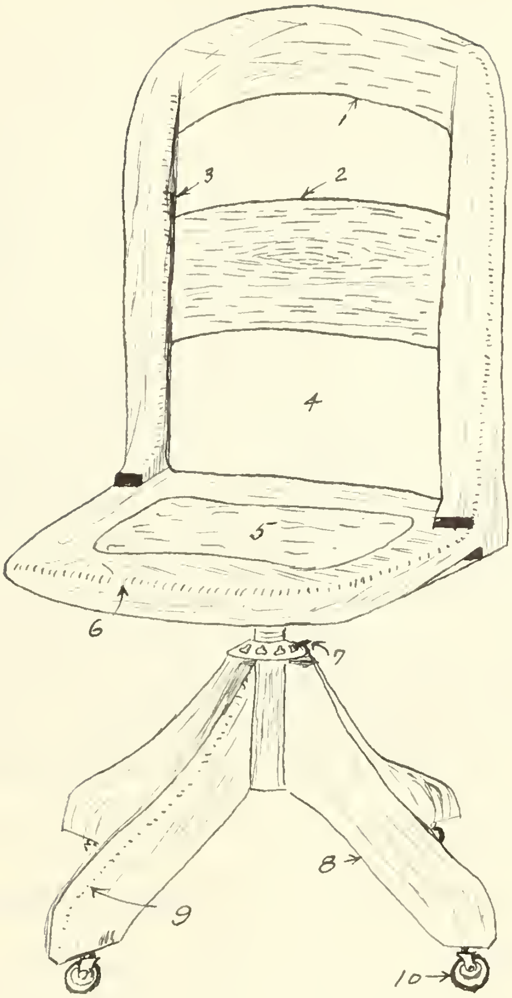

Exhibit XII. Leffingwell Correct Posture Chair

> is pivoted so that it moves with the body, giving a comfortable feeling of support at all times. 3. Adjustable range of back rest, 4 inches. This is sufficient for practically all variations in heights in people. 4. The space between the back rest and the seat is open, allowing the gluteal muscles freedom from obstruction and consequent discomfort. 5. Extra deep saddle-type seat--fits the form perfectly; so shaped that occupant automatically sits in correct and comfortable upright posture. 6. Rounded front edge of seat. There can be no under leg restriction of normal blood circulation. 7. Revolving and non-tilting. By pulling out a small lock pin, the seat can be swiveled (raised or lowered) until the feet rest firmly on the floor. Then release the lock pin and the seat will revolve freely without changing its height. The pivot back rest compensates for the non-tilting back. 8. The base legs are of one-piece construction, for maximum strength. 9. All edges and corners of the entire chair are rounded to provide utmost comfort and to eliminate blood restriction, as well as to prevent bruises to person and damage to clothing and shoes. 10. Easy rolling Atlasite (Bakelite) casters, 1-5/8 inch diameter.[1]

Obviously, a chair such as recommended above is somewhat more expensive insofar as first costs are concerned than the ordinary straight-back, flat seat, and rigid chair so commonly used. However, the difference in ultimate costs between these ordinary chairs and those incorporating the important comfort features will be offset many times during their life through the greater efficiency they will contribute to the office production.

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[1] William Henry Leffingwell, A Textbook of Office Management, New York, McGraw-Hill, 1932, p. 199

In the final selection of chairs it should be understood that, to the degree possible, they should be of a color and finish which will harmonize with the general character and appearance of the office in which they will be used.

5. Files and Cabinets

The problem of selecting files for office use has become a relatively simple one. In the first place, steel files have been universally adopted because they are fireproof and durable. In fact, files constructed of wood have become practically antiquated. Most files produced today are made in four or five sections, each designed to accommodate folders holding records falling within dimensions of 8½" x 11", the accepted maximum size of most office stationery and forms.

The five-drawer file offers an advantage in that it will accommodate more material per square foot of floor space than a four-drawer file. Its only disadvantage is the difficulty it presents to an office clerk of short stature in filing or withdrawing material from the upper drawer. However, for appearance sake, either the five-drawer or four-drawer file should be adopted as a standard, so that there will be uniformity in the height of the files located throughout the office.

If files are required to accommodate cards, legal size paper, or other documents requiring drawers of a different

dimension than those used in connection with the filing of the standard 8½" x 11" forms, an attempt should be made to obtain files of a height approximating that of the standard adopted.

Metal files are available in different finishes, although the one most commonly used is a solid olive drab, a finish which lends itself to the color schemes of most offices. Files can be obtained either with or without locks. Locks, of course, add to the purchase price, and unless the files are intended to harbor matters of a confidential nature, the additional cost of this feature is seldom justified.

In the average office there is usually required a cabinet for the storage of stationery, forms, and office supplies, such as pencils, carbon paper, scratch pads, rubber bands, and the like. Cabinets for this purpose, should, of course, match as nearly as possible the other steel equipment in the office.

6. Clothes Racks

Where space is not at a premium, or if a company feels that it can afford the expense, a cloakroom is a convenient adjunct to an office. In some instances, employees enjoy the facilities of a combination cloak and recreation room. However, it is usually customary to locate a clothes rack, for office employees' use, as near to the entrance of the office space as possible. The most practical fixture

for this purpose is a metal pipe fixed to a wall or to stands secured to the floor adjacent to a wall. Such a fixture should, of course, be painted or otherwise finished to harmonize with its surroundings. Immediately above the clothes rack a shelf should be constructed for the accommodation of hats, packages, and so forth. Also, at one or both ends of the rack, umbrella stands should be located to protect floor covering.

7. Drinking Fountains

The location of drinking fountains is dependent to some degree upon the sources of water supply. Aside from that restriction, however, drinking fountains should be so located as to make them readily accessible to all employees. To the degree possible, they should be situated in such a manner that the travel to and from them will cause the least disturbance to the office routine and will offer the minimum opportunity of visiting between employees.

8. Pencil Sharpeners

In most offices today employees are furnished with mechanical pencils which, of course, eliminates the need for pencil sharpeners. However, there are usually some departments, such as drafting or stenographic departments, which, because of the nature of their work, require the use of the ordinary lead pencil. In such instances, pencil sharpeners should be located at convenient points, and because, as in

the case of drinking fountains, the sharpening of pencils presents an excuse for employees to leave their desks, pencil sharpeners should be so arranged as to offer the minimum opportunity of visiting with other employees.

9. Wastebaskets

Wastebaskets may seem to be a trivial matter and yet in many offices, depending upon the character of the business, the accumulation of waste matter presents a considerable problem. As a matter of fact, it is not uncommon in some offices to have a janitor or someone in that capacity remove waste accumulations at certain intervals during the day. Ordinarily a wastebasket should be furnished each employee and normally it should be situated in the kneehole between the two sides of the ordinary desk so that it will be out of the way and as inconspicuous as possible.

Wastebaskets are available in different colors, sizes, shapes, and materials. Those of metal construction represent a somewhat greater initial cost, but are economical in the long run. From the standpoint of appearance, they should be of the same color and finish as the other office furnishings.

10. Miscellaneous Equipment

Incoming and outgoing mail trays, one-drawer letter files, hatracks, and any other miscellaneous equipment which might be required, should be selected with the view to having

them harmonize as much as possible with the general scheme of the office layout. The same principle should apply with respect to window shades, drapes, and floor covering.

CHAPTER V

MAKING A LAYOUT

A. Preliminary Steps

The previous chapters are intended to point out all the various phases of office layout and the many factors a good layout department must consider in the course of its function. All the matters touched upon must be borne in mind, individually and collectively, by the layout department if it may expect to fulfill its assignment effectively and successfully.

Procedure for the actual making of an office layout logically comes up for consideration at this point. As in any other problem, the first step is to determine the objective to be attained. To accomplish this, the layout department will find it helpful if it will obtain the answers to the following questions:

(a) What functions and type of work are to be performed in the space to be laid out?

(b) How many people will it be expected to accommodate?

(c) Shall the arrangement to be provided for be considered as a permanent one?

(d) What are the possibilities of the operations to be provided for--expanding or contracting?

(e) Are there any precedents or company policies to be considered and adhered to, as, for instance,

established standards with respect to the centralization of services and the use of particular types of equipment and furniture?

The very nature of the foregoing questions will suggest what importance the answers to them will play in the layout department's plans. To acquire a clear conception of the job it is to perform, it will be necessary for the layout department to have a thorough understanding with management and to discuss the needs of the various departments with their respective heads. As a matter of fact, throughout the course of layout work, officers and department heads should be consulted and kept informed as to the progress of the layout program so that suggestions can be considered as the work progresses.

B. Actual Steps

1. Tools

The following is a list of tools that should suffice to complete all but the finished drawings of an office layout:

(a) A drawing board, pencils, pens, straight edge, and a rule (preferably an architects)

(b) Templates or models

(c) All available records pertaining to the section of space under consideration, particularly copies of the lease and floor plans.

For the completion of working drawings, a drafting set and photostatic equipment will be required. However, unless the project is a large one, the procurement of such equipment probably would not be justified and in that event, outside services should be enlisted for the preparation of the final drafts.

2. Method

As indicated earlier, the purpose of office layout is to promote the smooth and efficient flow of office work, and therefore, it is logical that the work to be performed should be given prime consideration when developing or rearranging an office layout. In this connection, the preparation and study of work process or flow charts will prove to be of great value.

A process chart is a graphic presentation showing a step-by-step picture of a work routine and is the best means by which a series of operations can be visualized. Process charts were originally designed by Frank B. Gilbreth for industrial use and have proved of tremendous value in that field. Their use in the office has been limited, not because their value in that respect is less, but rather because many office planners do not recognize that the principles of "methods improvement" are applicable to all types of work. John W. Fuqua[1] clearly illustrates, by the means

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[1] John W. Fuqua, "Process Charts Prove Your Job Is Not Different", Factory Management and Maintenance, April 1946

of process charts, the similarity of factory and office jobs and how the same principles of "methods improvement" apply to each.

A flow chart is a type of process chart which depicts in particular detail the elements of time and distance with respect to work movements. Although process and flow charts are primarily important tools of the methods department, they can be used to great advantage by the layout department.

Whenever a relocation or rearrangement of an existing layout is involved, a study should be made to determine wherein the present layout is inadequate, and what features might well be retained in the new layout. Plans of the present layout should be reviewed, and if none exist, copies should be prepared. The paths which the major work operations presently follow should appear on such a plan, and flow charts should be constructed by competent personnel familiar with flow chart work. These flow charts should be studied carefully and then revised to form a basis for the new layout.

A scaled floor plan (one quarter inch to a foot is a convenient scale) of the new space should next be obtained, if not already available, and a study made of all the likely spaces for the purpose intended from which should be selected the one best suited. Preliminary selections should be based on the estimated area required with due consideration for the

relative position of the activities to be housed, with the rest of the office.

Next comes the use of templates, a method long used successfully in the factory, and lately finding favor in the development of office layout. A template is a two-dimensional figure, scaled to plan, and cut from cardboard or heavy paper in a shape to represent some object, work-place, or machine. By placing them on a floor plan it is easy to visualize actual arrangements. The great value of templates lies in the fact that they can be quickly relocated in order to determine the most satisfactory arrangement.

To create a new layout, templates should be cut for each piece of furniture and equipment planned for the new space. Arrange and rearrange these templates, keeping in mind the flow charts studied, and at the same time adhering to as many of the ideals of good layout as possible.

Frequent reference should be made to the flow chart during the course of which it is not unlikely that changes in the flow chart itself will suggest themselves. Every effort should be made to maintain standard-unit layouts already established.

Once a decision has been made with respect to any important phase of the layout, others should be consulted, particularly the supervisor of the space involved. Although there is no intention to suggest that the layout department

should be desirable to obtain general agreement on the various phases of the work as the job progresses. The layout department should be receptive to all worthwhile suggestions, but should stand firmly against any proposal which might result in the violation of good layout practices.

Frequently it will be desirable to develop several plans in order to facilitate comparisons in an effort to arrive at the best solutions.

The moving of the templates is a simple matter as compared to the moving of furniture and partitions, and therefore every effort should be made to arrive at the best result before any actual changes are undertaken. When a decision is reached, the template layout then becomes a model from which the working drawings can be made.

Because of the importance attached to the use of templates, a few hints are given here as to their preparation and use. Sheets of templates should be drawn by the layout department in multiple copies. These sheets should include all the various types of furniture and office machinery which are in common use throughout the organization. Then as the need for templates arises, it is merely necessary to cut out the desired pieces, and cover them with template paper. Both sides of this paper have an adhesive quality which facilitates the rearrangement of the templates, yet holds them firmly in place on the plan. This feature makes

template paper preferable to the alternate method by which thumbtacks are used to hold the templates in their respective positions.

It is not uncommon to use different colored paper in the preparation of templates to indicate the various types of equipment. This enhances the prime purpose of using templates which is to present a visual picture of the ultimate layout. It is well to choose colors which will produce good contrasting effects. Suggested colors are those used by the Metropolitan Life Insurance Company, i.e., salmon, fawn, yellow, green, and cherry.[1]

In lieu of templates some concerns have found it advantageous to use models. Through the use of models a fine effect is produced, however, because of their cost, their use is not ordinarily justifiable. Nevertheless, there are instances where their use is recommended, as, for example, in the case of an elaborate and costly project and where the final proposal of the layout department will be viewed by top officials. The three dimensional effects which are accomplished through the use of models make it easier for the layman to visualize the ultimate layout as envisioned by the layout department. Some companies have even gone so far, in the way of three dimensional layouts, as to not only show the layout of

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[1] Office Planning and Layout, Policyholder's Service Bureau, Metropolitan Life Insurance Company, 1930 Revised 1945

each floor, but all floors in conjunction with each other through the use of transparent plastics. So much for the hints on preparation and use of templates, and the possible use of models.

Going back now to the point where the template layout has been completed--the next step is the preparation of drawings. Usually, the drawing is prepared manually for reproduction in the form of blueprints. This process, because of the care for accuracy and neatness required, is not only a tedious and time-consuming job, but is subject to possible error. For this reason, the use of photoprints made directly from the template layout, is strongly recommended, for by that means, an exact reproduction is assured. If the template layout has been carefully prepared to scale, and suitably colored templates have been employed (as recommended earlier) the most effective results will be obtained. In any event, whether manually prepared drawings or the photoprint process is employed, a generous supply of copies should be made.

The purposes of these copies are numerous, as will be seen:

(a) On one copy all proposed electrical installations, including all lighting and underfloor ducts will be drawn.

(b) On a second copy the location of all plumbing, wash basins, and water coolers will be diagrammed.

(c) On the third copy the position of the air conditioning and ventilating system will be depicted.

(d) On the fourth day all the areas to be subjected to acoustical treatment will be shaded or otherwise indicated.

(e) On the fifth copy the location and kind of partitioning will be illustrated.

(f) On the sixth copy the number of individual telephones and their respective locations will be indicated.

(g) And, finally, on the seventh copy, each piece of equipment should be identified as to its function, and eventually, the initials, or some other means of identifying the prospective occupants' desks will also be noted.

After the above fill-in drawings have been prepared, several copies of each should be made, and for each set, written specifications should be drawn up, describing in minute detail all the pertinent information not shown on the drawings. Included in these specifications should be a

description of such items as acoustical material, partitioning, and floor covering, as well as any special instructions which may be required in connection with the installation of any of the aforementioned items.

The value of carefully drafted specifications will be realized when actual installations are being made. Where outside contractors must be called in, these specifications will serve as a basis for competitive bidding. The furnishing of all bidders with identical specifications and a full understanding of what is to be done, not only places them all on an equal footing, assuring fair bidding, but will also preclude any possible disagreement arising between the company and the successful bidder.

Copies of the respective working drawings and specifications should be distributed to the parties responsible for the various installations at the earliest opportunity. Such advance notice will not only be appreciated, but will tend to prevent any delay in the completion of the layout.

CHAPTER VI

MAKING A MOVE

A. General

All the basic principles involved in office layout thus far discussed are applicable with equal propriety to (1) the initial set-up of a business office, (2) the rearrangement of an existing office space, (3) the acquirement of additional space, as a result of expanding operations, and (4) to the instance where it is necessary, for one reason or another, to transfer operations from one location to another.

Because the last situation involves problems not confronted in the case of the first three, the subject of moving an office requires the special treatment to which this chapter will be devoted.

In some lights, the transfer of operations may be viewed as a troublesome problem involving a diversion of attention and time from regular operations, some interruption in routine, and is an inconvenience, to say the least. However, it has some brighter aspects. It does afford an opportunity to break with precedent and old-established practices which are usually difficult to correct, except in the course of a move. This is particularly true with respect to office layout, and therefore, the layout department should seize this opportunity to correct all the deficiencies which may exist in the layout to be vacated.

B. Reasons

The necessity for making a move may spring from any one of a number of circumstances, or combinations thereof, among which the most common are:

(a) When a department has expanded to the point where it no longer can perform its function efficiently.

(b) When profitable operations suggest the advisability of moving to a more pretentious location.

(c) When conditions necessitate the adoption of an economy program (which frequently occurs during periods of depression) recommending the securing of cheaper quarters.

(d) When a change in company policy takes place such as, for instance, the centralizing of certain services.

(e) When the need for modernization becomes apparent and the present space does not readily lend itself to a rearrangement and the adoption of new methods, machinery, and equipment.

Whatever the reason, it will now be necessary to take some very definite steps to make the move as quickly and efficiently as possible. If the following preliminary steps are pursued, a minimum disturbance to current operations

will result. They are all worthy of careful consideration regardless of the size of the move.

C. Preliminary Steps

1. General

Prior to making the actual move the entire procedure should be planned in the minutest detail. Every effort should be made to anticipate all problems which might possibly be encountered in the course of the move. The following are some of the questions which must be considered:

(a) What must be moved?
(b) When should the move be made?
(c) What must be done at the present location?
(d) What must be done at the new location?
(e) Who will make the move?
(f) Who should be notified of the move?

The individual assigned the responsibility of making the move should be supplied with two sets of layout plans, one covering the old location and the other covering the new. On the former, each item of equipment and furniture should be numbered in a sequence which will insure the arrival of each piece at the new location in such order that it can be most easily arranged.

Each piece of furniture and equipment appearing on the layout plan for the new location will be identified by

the same number assigned to it on the original plan. The numbers in this instance will correspond with those that will have been chalked on the floors of the new location, indicating the respective positions of each item to be transferred.

2. What Must be Moved?

As indicated in the preceding paragraph, a copy of the layout plan for the old location will clearly indicate what is to be moved and in what order.

3. When Should The Move Be Made?

The time of the move should be so arranged as to cause a minimum amount of disruption in the daily office work. A small move might be easily accomplished in the evening if started promptly at the close of the regular business day. Larger moves should be arranged to take place over a weekend. The hiring of additional help might be wholly justified if by that means any serious interruption in the routine is avoided.

4. What Must Be Done at the Present Location?

To each piece of equipment to be moved should be affixed a tag bearing the number by which it is identified on the layout plans referred to earlier. If the new location involves more than one floor, it would be advisable to use different colored tags, each color signifying a particular floor or zone.

All obsolete furniture and equipment which is not to be moved to the new location should be appropriately tagged

indicating its disposition. It may be decided to junk some equipment; some may be slated for sale to secondhand dealers, while a prospective tenant for the old location might be interested in buying any equipment which is not to be moved. In other words, no piece of unneeded furniture or equipment should be transferred and allowed to clutter up the new location. Therefore, unless it is expected to serve a practical purpose in the new arrangement, this is the time to dispose of it.

The same principle should also be applied in connection with dead-record files. Any papers or records which are unlikely to be referred to again should be disposed of prior to making the move. Such action will not only save the cost of moving records falling in this category, but it will also save valuable space at the new location.

Any work in connection with the move which can be done in advance of the actual move should be performed as early as possible. For instance, any records or equipment which are not in constant daily use can be packed in advance. It may also be possible to do certain dismantling work in advance, thus avoiding a lot of last-minute operations which might tend to interfere with or delay the move.

The office personnel should be instructed with respect to the part they should take in connection with the move. They should be instructed to clear, just prior to the move, all papers

and equipment from the tops of their desks. They should also be instructed not to pack anything in their desks which might become damaged in the move, particularly, such items as bottles of ink or other liquids. Desks and files having locks should be locked to prevent the sliding and possible damage to drawers during the course of the move.

Much confusion can be eliminated, and the loss of small pieces of equipment prevented, if each employee is required to package all items and material used in the course of his work which cannot be conveniently and safely stored in a desk or file. Cartons should be provided for this purpose and each labeled with the name of the individual whose desk equipment it contains. This procedure will also speed up the distribution of such material at the new location.

5. What Must Be Done at the New Location?

To the extent possible all work, such as the installation of electrical equipment, telephones, lighting equipment, and air conditioning equipment, should be completed before the actual move is started. The new space should be thoroughly cleaned and made ready for occupancy. As indicated earlier, the exact position where each item of equipment is to be located should be chalked on the floor and identified with the number corresponding with that appearing on the layout plans.

6. Who Will Make the Move?

Some large companies, because of the nature of their business, have their own moving facilities, both with respect to qualified personnel and proper equipment; however, normally it is necessary to call in professional movers. In any event, whoever does the moving should be given explicit directions and should be subject to close supervision to assure that the job is carried out as planned.

Professional movers are generally well equipped with the necessary moving facilities, as are companies which maintain their own moving crews. However, if a company attempts to make its own move without benefit of an experienced crew, it falls to the layout department to make certain there are available sufficient two and four-wheel trucks, dollies, and also covering to prevent the furniture and equipment from becoming marred or damaged.

7. Who Should Be Notified of the Move?

Although it is not normally the function of the layout department, it is customary, in the event of a move, to send printed notices to all who might be interested, such as customers, prospects, and suppliers. On the layout department, however, falls the responsibility of notifying public utilities, whose services are used, of an impending move. This is extremely important, for failure to make arrangements for the establishment at the new location of such services as telephone, gas, electricity, and water might seriously disrupt operations.

D. Making the Actual Move

If the aforementioned plans are laid carefully and followed closely, the actual move should prove to be a relatively simple operation. Two supervisors, one stationed at the old location and the other at the new, should be charged with the responsibility of seeing that the move is executed exactly in accordance with the plans. In addition, they should watch the operation closely, so as to be assured that the furniture and equipment is not subject to any undue rough handling. They should also caution the moving men not to slide the equipment in such a manner as to mar the floors at either location.

Arrangements should be made to have fixtures, equipment, and appliances which are power driven connected just as soon as possible after the arrival of the equipment at the new location. When everything is finally in its place and all necessary connections made, the new location should again be cleaned preparatory to the return of the office force to its regular routine.

If the move has been a large one, it might prove expedient to have guides on hand to direct the returning employees to their new work spaces.

E. Post Move Problems

After the move is completed and normal operations re-established, all records pertaining to the move should be

returned to the layout department for filing. If, during the course of the move, it has been necessary to deviate in any way from the original plans, changes in the layout resulting therefrom should be carefully noted on the plans.

There are likely to be some criticisms from various persons or departments concerning the change, some of which will be legitimate, and if they are obviously sound, remedial action should be taken promptly. On the other hand, it must be remembered that certain individuals have a natural aversion to any change, and unless their complaints or suggestions appear justified, it would be well to deter making any changes until the new arrangement has been thoroughly tested.

The layout department, having completed its task, should now file all papers and records pertaining to the move so that they will be readily available for future reference in connection with periodic reviews to determine the effectiveness of the layout, or in connection with any subsequent moves or changes which may be contemplated.

CHAPTER VII

CONCLUSIONS

In conclusion, it is probably well to summarize briefly some of the principal objectives which the foregoing study has attempted to emphasize and which are the very fundamentals of the art of office layout. In the first place, it is a function so important to the operations of a business as to justify the assignment of a particularly qualified individual or department to its performance. In other words, office layout work should be recognized as a particular segment of business, ranking in important with any of the other phases of modern business which have developed into individual entities within the business organization; such as sales departments, traffic departments, bookkeeping departments, and so forth. Because of the product of the layout department's effort is not as easily appraised as, for instance, that of the sales department, its importance has not been fully recognized; as a matter of fact, the whole science of office layout has been more or less neglected.

The influence of good office layout technique can have a tremendous effect on the character of a business. Because the prime object of a business, at least in the commercial world, is to yield satisfactory earnings for the benefit of the owners or stockholders, the savings in

expense which the layout department can contribute through more efficient operations is the principal factor which justifies its existence.

In large organizations, where the relationship between management and employees is relatively remote, the layout department can do much in these labor-troubled times to compensate for the lack of the intimate understanding which is possible and usually exists in smaller companies. By recognizing the rights and the needs of employees with respect to their physical comforts, the layout department can do much toward creating and maintaining a personnel of high morale and efficiency. Through its efforts, the layout department can eliminate many of the common inconsiderations and inconveniences to which employees are frequently and thoughtlessly subjected, and which are usually magnified to proportions which can result in a serious impairment of efficiency.

One of the principal tools or means by which a layout department can accomplish the desirable ends indicated, is the practice of standardization, and for this reason such practice has been stressed throughout the suggested program. Many of the modern office facilities have been developed independently of one another, partly because of the rapid progress which has been made in industrial development, and partly because of a lack of recognition of the value of standardization. However, in the light of the growing

appreciation for the need for standardization, it is reasonable to expect that, as time goes on, producers of the various facilities referred to will tend to have their respective products complement one another to a much greater degree than is presently the case.

Although there has been an attempt here to cover only the major factors to be considered in layout work, an alert and conscientious layout department will discover many additional ways and means of contributing to the fulfillment of the principal objectives enumerated, and if the focusing of attention upon the principles which have been dwelt upon, will tend to direct management's thinking along the lines suggested, this submission will have served a purpose.

BIBLIOGRAPHY

Benge, Eugene J. Cutting Clerical Costs, New York, McGraw-Hill Book Company, 1931

Bullard, J. E. "Improving the Office Layout", The Office Economist, March, April 1941

Bullard, J. E. "Saving Steps in the Office is Saving Time", The Office, June 1938

"Camera Reports on Modernization", American Business, February, July, 1940, January, June, July, 1941

"Check Your Office on These 333 Points", Management Methods, New York, McGraw-Hill Book Company, 1933

Clift, Carlton E. "Office Layout and Planning", National Office Managers Association Forum, October 1945

"Cost Savers for Your Office", Modern Industry, September 1946

Crawford, John, "Physical Factors in Life Insurance Offices", Proceedings of the 1939 Annual Conference of the Life Office Management Association, New York 1939

Darlington, George M. Office Management, The Ronald Press Company 1942

Dasey, Homer H. "Better Layouts Quicker with Scale Models", Factory Management and Maintenance, December 1944

"Departmental Layouts", National Office Managers Association Bulletin, Volume V, No. 4, April 1939

DeVries, George, "Selling the New Layout", Factory Management and Maintenance, November 1945

Douglass, Lathrop, "New Departures in Office Building Design", Architectural Record, October 1947

Douglass, Lathrop, "Perhaps the Best is Actually the Cheapest", Architectural Record, October 1947

"Effect of Color of Walls and Ceilings on Resultant Illumination", Lighting Data, Edison Lamp Works of General Electric Company, May 1922

BIBLIOGRAPHY (continued)

"Executive Offices Designed for Flexibility, Convenience, and Multi-Use", *Architectural Record*, March 1945

"First Steps Taken to Produce Greater Office Efficiency; Standardization Studies on Office Equipment", *Industrial Standards*, June 1947

Fuqua, J. E. "Process Charts Prove Your Job is Not Different", *Factory Management and Maintenance*, April 1946

Garth, John, "Frank Lloyd Wright Designs the Office of the Future for S. C. Johnson and Son, Inc.", *American Business*, Jay 1939

Greenwood, Walter S. "Improving Office Selling", *The Office*, December 1946

Harrell, H. M. "Office Planning and Arrangement", *The Office*, July 1946

Heal, J. S. "Check These Layout Points", *Factory Management and Maintenance*, February 1943

Heidman, Paul G. "Planned for Efficiency", *Buildings and Building Management*, August 1938

Honegger, A. "Office Layouts that Speed Work and Cut Costs", *American Business*, July 1938

"How Good is Your Office Layout", *National Safety News*, March 1947

"How's Your Reception Room?" (Photographs of reception rooms) *Office Equipment Digest*, January 1941

Ickes, Lynn S. and others. "Housing and Equipping the Office for Maximum Production", *Proceedings of the National Office Managers Association*, 1940

Kahn, Jacques, "Office and Loft Buildings: Considerations of Their Past, Present, and Future", *Architectural Record*, April 1943

Kelly, Nicholas J. "Procedure Investigation and Analysis", *The Office*, December 1945

BIBLIOGRAPHY (continued)

Kelly, Nicholas J. "Making the Flow Chart", The Office, October 1945

"Layout Technique and Procedure for Departmental Floor Plan", Life Office Management Association Bulletin, Volume V, No. 4

Leffingwell, William Henry, A Textbook of Office Management, New York, McGraw-Hill Book Company, 1932

Leffingwell, William Henry and Edwin Marshall Robinson, Textbook of Office Management, New York, McGraw-Hill Book Company, 1943

Lincoln, Leslie, "Blueprints That Move", Office Economist, No. 4, 1945

MacDonald, John H. Office Management, New York, Prentice-Hall, Inc., 1946

MacIlroy, Frank G. "Future Developments in Office Equipment", The Management Review, American Management Association, February 1946

May, George S. "Stepping Up Production in the Office", Office Equipment Digest, October 1944

Maze, Colemen Lloyd, (ed.) Office Management, A Handbook, New York, Ronald Press Company, 1947

"Models Built to Scale Show What Goes Where", Factory Management and Maintenance, May 1945

"Money Saving Partitions", Buildings and Building Management, February 1939

The National Fire Codes for Building Construction and Equipment, National Fire Protection Association, Boston 1944

Neuner, John J. W. and Benjamin R. Haynes, Office Management and Practices, Cincinnati, South-Western Publishing

"Office Planning and Layout", Metropolitan Life Insurance Company, 1930, Revised 1945

"Offices Out of the Ordinary", Office Equipment Digest, April 1945

BIBLIOGRAPHY (continued)

Onderdonk, Chester D. "Private Offices in Industry", A Survey by the American Management Association, January 1941

Pennicke, Harold C. "Layout Standards for Modern Offices", The Management Review, August 1945

Pennicke, Harold C. "Office Layout for Effective Operations", Office Management Series, No. 110, American Management Association, 1946

Pennicke, Harold C. "Serious Study Serves as Keystone in Planning Effective Layout and Flow of Office Work", The Office, December 1939

"Planning, Layout and Clearances", Architectural Record, December 1938

"Plans to Help Modernize Executive Offices; Sun Electric Corporation", American Business, August 1947

"Practical Answers to Your Problems", A Panel, Conference Proceedings of the National Office Managers Association, June 1944

Recommended Practice of Office Lighting, Committee on Office Lighting of the Illuminating Engineering Society, July 1947

Reinecke, John J. "Designs Furniture to Raise Office Morale", The Office, January 1947

Reinhard, L. Andrew and others, "Modern Offices", Architectural Record, March 1945

Ripnen, Kenneth H. "An Efficient Office Layout for a Large Tenant", Buildings and Building Management, November 1937

Ripnen, Kenneth H. "Office Layouts", National Office Managers Association Forum, April 1943

Ripnen, Kenneth H. "Office Layouts", Office Equipment Digest, August 1940 - May 1943

Ripnen, Kenneth H. "Office Space Administration", Office Management Series, No. 114, American Management Association 1946

BIBLIOGRAPHY (continued)

Ripnen, Kenneth H. "Planning an Office Layout to Fit the Tenent", *Buildings and Building Management*, October 1936

Ripnen, Kenneth H. "The Plant Office--Layout and Building", *Office Management and Equipment*, May 1947

Robinson, E. M. *Business Organization and Practice*, New York, McGraw-Hill Book Company, 1945

Ross, H. J. "Wanted: A Truly Modern Office", *American Business*, January 1947 to May 1947

Rudolph, Walter, "Micro-filming Saves Hospital $10,000 in Additional Space", *The Office*, April 1947

Sansonetti, J. H. and R. W. Mallick, "To Insure Low-Cost Production - Adopt the Best in Layout", *Factory Management and Maintenance*, August 1945

Sanzenbach, A. E. "Laying Out the Office for Maximum Production", *Conference Proceedings of the National Office Managers Association*, June 1940

"Space Management in the Office", *The Office Economist*, March 1932

"Standards for Measuring Office Efficiency", *Office Management Series*, No. 110, American Management Association 1946

Stricker, A. H. "Office Equipment and Arrangement", *Office Appliances*, February 1943

Stricker, A. H. *Seven Steps Toward Simplified Office Procedures*, New York, McGraw-Hill Book Company 1943

Strode, R. M. "Better Offices for Better Service", *Employment Service Review*, July 1946

"Supervisor's Function in File Room Layout", *Office Management and Equipment*, November 1945

"Three Dimensional Models Cut Office Layout Costs", *American Business*, November 1946

Tucker, Cyril T. "Three Ways to Lay Out a Personnel Department", *Factory Management and Maintenance*, September 1943

BIBLIOGRAPHY (continued)

Vinton, George, "Office Layout and Planning", National Office Managers Association Forum, October 1945

"Visual Layouts", Building and Building Management, January 1940

"When You Need More Office Room", American Business, May 1943

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